# Appendices —

## Changes Between Draft and Final

The following changes were made to the Appendices between the draft and final SEIS. Minor corrections, explanations, and edits are not included in this list.

Changes/edits were made to:

- Describe how direction in Appendix 3 relates to the alternatives;
- add additional information about Clorox including a description of fish-killing spills that happened during the Biscuit Fire in 2002 to Appendix 4;
- replace the direction for developing a resistance seed deployment strategy in Appendix 6 with a “planting assumption” describing the amount and location of expected resistant seedling planting and describing how it is expected to grow;
- add the draft Biological Assessment for “Endangered Species Act”-listed fish to Appendix 7;
- add Appendix 10 to respond to substantive public comments;
- add Appendix 11 to display the letter received from government agencies;
- add Appendix 12 to list the uninfested watersheds for Alternatives 3 and 6;
- add Appendix 13 to include an updated equipment cleaning checklist.

## Appendix 1: Port-Orford-Cedar Management Guidelines

The “Port-Orford-Cedar Management Guidelines” (1994) are included here because they are part of current management direction for the Roseburg, Medford, and Coos Bay Bureau of Land Management (BLM) Districts referenced in the description of Alternative 1 in Chapter 2. The document was retyped in its entirety during the preparation of the draft supplemental environmental impact statement (SEIS), and any differences between this version and the original are editorial only. Note that the Table of Contents page numbers for these Guidelines have been changed to reflect formatting for insertion into this document. Note also that the reprinted Guidelines have their own appendices (Appendix 1–4), that should not be confused with the appendices (Appendix 1–11) for this SEIS.

# PORT-ORFORD-CEDAR MANAGEMENT GUIDELINES

**U.S. Department of the Interior**
**Bureau of Land Management**

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*[Note: This document was retyped during the preparation of the draft Port-Orford-Cedar Supplemental Environmental Impact Statement. Any differences between this version and the original are editorial/formatting only.]*

# PORT-ORFORD-CEDAR MANAGEMENT GUIDELINES

U.S. Department of the Interior
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## I. INTRODUCTION

POC (*Chamaecyparis lawsoniana* [A. Murr.] Pari) (abbreviated hereafter as POC) is a minor but valuable component of the forests of southwester Oregon and northwestern California. It is usually found as scattered individuals in a stand but can also occur in continuous stands. Population distribution inland is usually associated with drainages, particularly in the southern portion of its range (Atzet, 1993). The species occurs primarily at low-to-mid elevations but has been found up to approximately 7,000 feet in northern California (Greenup, 1992a). The greatest concentration of POC is in Oregon in the northern third of its range, on the coastal hills and terraces from Coos Bay to Port Orford and in the adjacent southern edge of the Coast Range, including the drainages on the middle and south forks of the Coquille River (Zobel, 1985). Secondary concentrations occur in land at moderate-to-high elevations near the Oregon/California border and in the watersheds of Grayback Creek and Deer Creek in southeastern Josephine County, Oregon (Atzet, 1979; Hawk, 1977). Throughout its range, the species is under attack by the fatal fungal pathogen *Phytophthora lateralis* (*P. lat.*), which causes POC root disease (Kliejunas, 1981). Forest management activities such as road construction, timber harvest, site preparation, and fuels treatment can increase the risk of spreading the disease by introducing the pathogen to uninfested areas.

POC spans the floristic transition one between the vegetation of California and the Pacific Northwest (Harrow and Harrar, 1969). POC occurs in five plant series in the Klamath Province: white fir (A*bies concolor* Gord. & Glend.), western hemlock (*Tsuga heterophylla* [Raf.] Sarg.), POC, tanoak (*Lithocarpus densiforus* [Hook and Arn.], Rehd.), and Jeffrey pine (*Pinus jeffreyi* Grev. And Balf.) (Atzet and Wheeler, 1984). Tree associates range from Sitka spruce (*Piceal sitchensis* [Bong.] Carr.) in the northern part of the POC range to incense-cedar (*Calocedrus decurrens* [Torr.] Florin) at the lower latitudes. Other common tee species associated with POC include Douglas-fir (*Psuedotsuga menziesi monticola* Dougl.), sugar pine (*Pinus lambertinana* Dougl.), and red alter (*Alnus rubra* Bong.) (Harlow and Harrar, 1969). In addition, the range of POC overlaps an area of high plant diversity containing many other endemic species.

POC is limited to areas with relatively high ratios of precipitation to evaporation (Zobel et al., 1985). POC is opportunistic, and it can establish itself in quantity during early seral stages, after disturbance in stands and under an intact forest canopy. The species is shade tolerant and also grows well in the open. Zobel (1990) found that POC reached breast height in 5 to 11 years in clearcuts; and under a forest canopy, it took 14 to 31 years. Good seed crops can occur as often as every 4 or 5 years but generally not for 2 years in a row (Zobel, 1979).

## II. *PHYTOPHTHORA LATERALIS* AND PORT-ORFORD-CEDAR

The first external evidence of the root disease is a slight discoloration of the foliage which, within a few weeks to months, depending on the weather conditions and tree size, gradually takes on a yellow wilted appearance. The color changes from yellow to bright red, then to red-brown, and finally brown. Trees usually lose all foliage 2 to 3 years after death. POC root disease is best identified by the cinnamon-colored inner bark and cambium that abruptly joins the creamy white, healthy inner bark in roots and lower boles. Just prior to tree death, the discolored zone may extend 2 to 5 feet above ground (Hadfield et al., 1986).

An infection of *P. lat.*, possible and introduced pathogen, was first reported in an ornamental POC near Seattle, Washington, in 1923. It was fond in southwestern Oregon in 1952 (Roth et al., 1987). There is no proven resistance to *P. lat.* with POC although occasional POC remain alive after surrounding POC have been killed (Hansen et al., 1989). Whether this survival is due to some degree of resistance or lack of exposure of the pathogen remains unclear.

*P. lat.* is a root-inhabiting fungus transmitted via soil and/or water. The pathogen enters through root grafts or directly through the tips of fine roots (Gordon and Roth, 1976). Damage from this moisture- and low-temperature-dependent fungus peaks during the cool, wet season; but crown symptoms lag behind due to abundant atmospheric moisture. As moisture stress builds in late spring and summer, the damaged root system is unable to meet the evapotranspiration requirements of the tree. This results in the simultaneous death of the crown (Zobel et al., 1985). While seedlings and small POC quickly succumb to the pathogen, large POC may take a year or more to die.

The resting spores (chlamydospores) develop in rootlets and are released into soil as the roots deteriorate. The dormant chlamydospores form fruiting bodies (sporangial) in saturated soil, which in turn release motile zoospores. Zoospores required flowing water to travel any distance. The fungus survives as chlamydospores in soil without a host for up to 4 years in northwestern California (Kliejunas, 1992). Spore survival, without a host, in the Coos County forest and at Oregon State University has reached 6 years and 7 years, respectively. At both sites, chlamydospore population levels are on a downward trajectory (Hansen, 1994).

Chlamydospore survival rates decline during periods of summer drought, which is a normal occurrence in portions of the range of POC. A significant decrease in spore survival occurred when isolated organic matter, and organic matter in soil containing *P. lat.* spores, was stored in sealed plastic bags and heated to 68 degrees Fahrenheit for a period of 18 weeks. At this same temperature, survival of *P. lat.* inorganic matter was favored in moist soil, but not in saturated soil. Naturally infested organic matter in clay soil stored in sealed plastic bags did not show a decreased survival in moist soil (0.3 bars tension), but did show decreased survival in saturated soil (0 bars tension). In slightly dried soils (approximately 25 bars tension), *P. lat.* survived at only very low levels after 16 weeks at 68 degrees Fahrenheit (Ostrofsky et al., 1977).

Spore transport occurs via a variety of mechanisms. Logging equipment, vehicles, humans, and animals (particularly elk) can transport infested soil (Zobel et al., 1985). It can be transmitted by surface water in streams or ditches. Disease transmission can also occur via root grafts and, in some rare instances, through rain splashed spores (Gordon, 1974). Trees in close proximity to the stream channel downstream from infected areas have the best chance of contracting the disease. Upslope spread is more difficult, occurring through root grafts and possibly by disease movement from infected to uninfected POC roots that are in close proximity to each other (Gordon, 1974).

If soil infested with chlamydospores is transported to uninfested areas, new infections can occur. This requires a precise sequence of events: chlamydospores must reach POC root tips; germination must occur; and the root tips must be penetrated to initiate infection. *P. lat.*, while fatal to POC, may not be the sole cause of death in a given tree. Microsite conditions such as moisture stress, mechanical damage, or insects can contribute to mortality.

Once a tree becomes infected, mortality is frequently rapid. However, when infestation occurs in an area, it is rare for all of the POC to become infected. Surveys done in areas where the pathogen has been present for 30 years have shown that not all POC were killed (Schoeppach, 1991). Whether this phenomenon is due to resistance, isolation, unknown factors, or a combination of these, is not clear.

### III. ***PHYTOPHTHORA LATERALIS*** **AND PACIFIC YEW**

Recently, it has been documented that Pacific yew (*Taxus brevifolia* Nutt.) is also susceptible to *P. lat.* (DeNitto and Kliejunas, 1991; Greenup, 1992). Pacific yew contains taxol, a compound which has shown promise as an ovarian cancer treatment. The Pacific yew mortality only occurred in areas where there are also infected POC. No mortality due to *P. lat.* has been documented on BLM lands.

Pacific yew infected with *P. lat.* show the same symptoms as those seen on infected POC. Crown discoloration and cambium stain occur. It appears that the resistance to *P. lat.* within Pacific yew is more variable than that seen in POC (Greenup, 1992a).

### IV. MANAGEMENT OBJECTIVES FOR PORT-ORFORD-CEDAR

POC requires special protection because it is an important component of some forest ecosystems, it is economically valuable, and it is vulnerable to an introduced pathogen that is spread primarily through human activities.

A. Proactive management – limit the spread of *P. lat.* and reduce the number of infested areas.

B. Retain POC as a species, identify resistant individuals, and incorporate them into a tree improvement program.

C. Incorporate *P. lat.* control strategies as management objectives in Riparian Reserves (RRs), Late-Successional Reserves (LSRs), and Matrix.

D. Provide POC as a primary forest product.

E. Promote public involvement in POC management.

F. Develop a budget and implementation schedule for the Port-Orford-Cedar Management Program.

## V. IMPLEMENTATION STRATEGY TO ACHIEVE POC MANAGEMENT OBJECTIVES

A. Proactive management – limit the spread of *P. lat.* and reduce the number of infected areas.

The intent is to stop the spread of *P. lat.* into POC and Pacific yew populations, and to design and implement management strategies that decrease the number of disease locations in a manner consistent with objectives identified in district resource management plans. At present, no documentation exists that indicates a successful eradication of *P. lat.*, on a specific site has been accomplished. A management strategy for an area may include POC eradication and preventing POC regeneration until the inoculum present on the site dies out. The ultimate goal is to reestablish POC into those areas where the pathogen had previously existed.

An accurate inventory of POC and *P. lat.* is essential for the development of a management strategy. Populations of POC should initially be mapped geographically by plant series and associations. Areas where POC is found should then be subdivided according to seed zones and elevation bands. Areas where timber harvest has occurred that still contain POC populations must be examined for the occurrence of *P. lat.* Areas with POC present, and where no harvest activities have occurred, should receive the same analysis.

The inventory of POC and *P. lat.* areas will be ongoing as the POC management strategy is implemented. At a minimum the inventory should include the following:

1. Determine which POC areas also have populations of Pacific yew.

2. Track all occurrence of POC populations and *P. lat.* infestations in MICRO*STORMS (M*S) and Geographic Information Systems (GIS).

3. Analyze the relationships between infested and uninfested areas (i.e., what is the probability of the uninfested stand becoming infested?) Further analysis should examine if *P. lat.* infested sites are expanding, stable, or decreasing, the relationship of *P. lat.* population trends to land management activities, and the specific reasons for the impacts to *P. lat.* populations.

4. Monitor for occurrence of *P. lat.* and the effectiveness of management of the pathogen and disease control. Monitoring projects will need to continue for at least 5 years in the drier portions of the range of POC and for longer periods where climatic conditions are wetter.

This information should be consolidated in an annual report.

All entries into POC areas should be coordinated with the district POC program lead and the resource area silviculture group(s). The forest development program should incorporate POC objectives in reforestation, timber stand improvement, and the development of silvicultural prescriptions. Strategies to meet road construction, renovation, maintenance, and road management objectives need to include POC goals. Existing timber sales that do not address POC should be modified to include consideration for POC management. Entries are not just those for timber sales or silvicultural activities. They include, but are not limited to, such things as firewood cutting, hunting, and any other actions within POC areas.

There are at least three key risk indicators regarding the introduction of *P. lat.* to uninfested sites. The first is the potential for infested soil to be transported upstream of uninfested POC areas due to an increase in exposure points such as steam crossing or roadwork (new construction, renovation, maintenance, or decommissioning). Recreational activities such as horseback riding, off-road vehicle traffic, or even mountain bike riding could also increase the chances of *P. lat.* infection. The second factor Is the duration of the increased risk; that is, the number of trips by logging trucks, logging machinery, etc. The more trips, the greater the potential for infection. The third risk indicator is the season in which activities occur in POC areas. Activities that occur during the wet season have a greater potential to move infested soil to areas that presently do not contain *P. lat*. A risk analysis procedure has been developed by the USFS and is presented as Appendix 4 is this paper. This appraisal should be conducted for all areas containing POC.

POC, *P. lat.*, and Pacific yew mapping will be the key to success of the Interregional POC Coordinating Group, of which BLM is an active participant. This group was established in 1987 to ensure a coordinated, interregional, interagency effort to manage the root disease. The group structure has recently been reorganized into two areas: a policy oversight team and a technical team. The policy oversight team will include a representative from: (1) Forest Pest Management in USFS Region 5, (2) Forest Insects and Diseases Group in Region 6, (3) the Forest Supervisors, and (4) the Oregon/Washington State Office and Medford District Office of the BLM.

B. Retain POC as a species, identify resistant individuals, and incorporate them into a tree improvement program.

The goal is to join with the USFS in its research program to identify genetic resistance to *P. lat*. Resistance is defined as slowing the rate of a pathogen's advance in diseased tissue, rather than immunity. No trees have been identified that have the potential to stand up indefinitely in areas of extreme inoculum exposure. However, though a breeding program, the possibility of producing stock with a high level of resistance certainly may exist (Martinson, 1994). As with Douglas-fir, POC has a wide tolerance for variations in environment (probably related to genetic variability) that allows it to compete successfully in a wide range of environmental conditions (Millar et al., 1991). This great ecological amplitude of POC is believed to reflect a geographic concentration of genetically-based characteristics that had developed in a much larger geographic range (Edwards, 1983).

In the past, ornamental varieties of POC have been grafted to root stocks of *P. lat.*-resistant members of the family Cupressaceae with varied success (Torgeson et al., 1954). Research continues regarding POC and *P. lat*. Currently, the Pacific Southwest Research Station is conducting a rangewide genetics study on POC. Under contract with the USFS, researchers at Oregon State University are evaluating the survival of potentially resistant parent trees, collecting seed and vegetative material from parent trees for propagation, and screening seedlings and rooted cuttings for resistance (Greenup, 1992b). With the exception of the Coos Bay District, BLM has not been actively involved with these programs in the past. However, there are opportunities to support upcoming studies on POC. Specific actions include, but are not limited to, identification of resistant POC, cone collections from suspected resistant individual trees, and outplanting of seedlings grown from collected seed to test resistance. These research opportunities should be anticipated and aggressively pursued. Management objectives and practices will need to be reviewed and updated as additional research is published.

Current searches for resistance are in highly-infested areas where selection pressure has been present for some time. Single trees that have survived in areas of sever mortality may be resistant. Harvesting or precommercial thinning of POC in infected areas should be preceded by evaluation of the POC population for resistance. All trees should not be tested, as this is biologically unnecessary as well as financially impractical. Even the most ambitions sampling schemes cannot test all trees within a given population. The probability of removing a tree with some level of resistance is extremely low in areas that have not seen extensive mortality (Greenup, 1992a).

The current screening process for POC with resistance has been underway for over 10 years. The screening criteria was developed by Dr. Lewis Roth and Dr. Everett Hansen of Oregon State University, Don Goheen of the Southwest Oregon Forest Insect and Disease Technical Center et al. Screening includes POC stem inoculation with *P. lat.*, soil inoculation with *P. lat.* and transplanting POC into the infested soil, and immersing the root of seedlings and rooted cuttings in a water suspension of *P. lat.* zoospores (Hansen et al., 1989). Over 200 selected trees are currently being evaluated for resistance. Discussions with USFS geneticists and pathologists indicate an extremely low potential for loss of resistance by harvesting or other removal of POC (Greenup, 1992a). Timber sales involving green POC should be evaluated for resistance candidates prior to harvesting.

<u>Guidelines for selecting trees in the wild for resistance:</u>

1. Select trees that appear to have been exposed to the fungus. Selected trees should retain green crowns and be in close proximity to those exhibiting symptoms of *P. lat*.

2. Select trees in previously infested areas that stay wet for long periods of time.

3. Selected trees that are not elevated on rises above existing infected trees. Roots should be wet or have been subjected to the same water flow as infected trees.

4. The candidate tree should have root disease killed trees above and below it on the same slope.

5. Trees should have normal-looking green foliage and should have been exposed at the time the existing dead trees were exposed.

6. POC roots graft with roots of other POC. In wet areas, the pathogen will involve the entire area.

7. Trees occurring on the edges of visibly infested sites can be selected for resistance testing if they meet the probably exposure criteria (Greenup, 1992a).

Some POC populations occur on lands set aside for uses other than timber production. It will be necessary to ascertain which seed zones and elevation bands containing uninfected POC colonies are not represented in the set aside areas. Additional uninfected POC populations may need to be reserved for maintenance of POC gene pool diversity. Populations that are reserved should be selected by plant series and associations. POC genetic diversity appears to increase with decreasing elevation and soil diversity (Millar and Marshall, 1991). In general, BLM lands are lower in elevation than those administered by the USFS. Therefore, POC populations on BLM lands may have a greater genetic diversity that that currently known to exist.

C. Incorporate *P. lat.* control strategies as management objectives in RRs, LSRs, and in the Matrix.

There are some specific situations involving POC management that deserve distinct consideration: management actions in infested RRs, LSRs, within the Matrix, or other special management areas that contain *P. lat.* or uninfected POC. These areas will require application of site-specific procedures. With careful consideration, an integrated strategy can be developed where more than one resource value can be enhanced. Any action(s) taken must be consistent with the management objectives identified in the district RMO for these areas.

1. Riparian Reserves

Riparian areas may contain diseased POC. In some areas, it may be possible to remove POC while at the same time maintaining riparian quality. To realize the full benefits for the riparian management area, consult with the wildlife biologist, fisheries biologists, hydrologists, and other resource specialists to identify the specific objectives for that riparian area, and how POC management can assist in attaining these goals. POC management within RRs must conform to the Aquatic Conservation Strategy (USDA and USDI, 1994).

Live trees showing signs of infection, but needed to increase the dead wood component in riparian areas, could be girdled and left to fall or felled intentionally if additional down woody material is required immediately. The presence of snags and logs in most environments make them particularly valuable to amphibians (Oliver, 1992). One contribution from POC management that could provide immediate and future benefits is the status of the coarse woody material component of the riparian area. Determine whether the riparian area's present and predicted future requirements for large woody material are being and will continue to be met. If additional material is required, specialists can use geometric and empirical equations based on tree size and distance from the stream to identify POC that can provide large woody material recruitment (Robinson and Beschta, 1990). Because of their resistance to decay, POC snags and logs are long-lived components of riparian habitat (Jimerson and Creasy, 1991).

Riparian area containing dead or diseased POC must be surveyed to determine whether an adequate amount of snags and down logs exist. Girdled trees would create snags and future sources of coarse woody debris. If existing levels of down wood are less than desired, POC could be felled; either to provide down logs outside the stream or to crate an in-channel structure. POC logs also provide organic input as well as structure to streams where anadromous fish spawn.

Preliminary work has been done in determining these figures. USFS data for both the POC and Tanoak series give some indications of the snag component for these forest communities where little human disturbance has occurred (Atzet and McCrimmon, 1992). Unfortunately, data for down coarse woody material has yet to be developed; but the case can be made that is the natural snag component is maintained over time, coarse woody debris requirements will also be maintained. Snags and other woody debris need not, and should not, be recruited solely from POC; but dead POC does present an opportunity to provide a habitat component that may be lacking.

Since the disease can move via root grafts, monitoring would be required to determine if root contact between uninfested POC and the infection center has been broken. There is little information available regarding the development of POC root systems. The only detailed description of POC root systems is for a 50-year-old dense stand in coastal Coos County. In this stand, 0.6 percent of the major roots extended beyond 6.7 meters from the bole of the tree (Gordon, 1974; Gordon and Roth, 1976). Based on this work, treating an area infected with *P. lat.* could include green POC adjacent to the infection site and currently showing no sign of *P. lat*. This could involve the removal of the live host (green trees that show no sign of infection) adjacent to the infection site. Again, removal could involve girdling, cutting and leaving the tree, or even harvesting the green POC. Elimination of live POC adjacent to infection sites would further reduce the potential for *P. lat.* propagation. This strategy has been implemented on the Gold Beach Ranger District, Siskiyou National Forest (Gee, 1993). In this case, all POC within a distance equivalent to five times the crown radius of the infected tree(s) have been removed.

There will often be portions of the RR infested with *P. lat.* that have POC too small to be girdled. One management approach could be to girdle POC greater than six inches dbh, slash smaller POC (down to 1 inch in diameter at 1 foot), and use prescribed fire to kill POC that are too small to slash. The prescribed fire treatment utilized could be a broadcast burn, underburn, swamper burn, or whatever application of fire best fits the objectives for the riparian management area. Of course, this would only be applicable where prescribed fire is consistent with RR objectives. Due to the sensitivity surrounding the use of herbicides, it is recommended that they not be utilized in removing POC.

No commodity extraction of POC should occur prior to a watershed analysis. After a watershed analysis is complete commodity extraction could occur if it is consistent with objectives identified in the watershed analysis.

2. Late-Successional Reserves

A second area of concern are areas containing *P. lat.* that are within LSRs. Management objectives for LSRs are to protect and enhance conditions of late-successional and old-growth forest ecosystems which serve as habitat for late-successional and old-growth-elated species, including the northern spotted owl (USDA-USDI, 1994). In those areas where POC provides a significant portion of the forest canopy, *P. lat.* could, over time, contribute to canopy loss and be detrimental to maintaining quality LSR habitat. Treating the pockets of *P. lat.* that occur within LSRs will have some short-term impact on canopy cover and species diversity; but by isolating or eliminating the diseased area or areas, POC may be retained inside the LSRs and contribute to overall species diversity.

As stated above under RRs, considerations for snags, down woody material, and their associated resource values are necessary in LSRs. Consultation with wildlife biologists and other resource specialists will determine management opportunities. Creative management can reduce *P. lat.*, enhance the amount of snags and down woody material, ensure snag and down woody material recruitment, and perhaps even provide some timber volume for commodity production.

The intent is to isolate *P. lat.*-infested areas and to reduce the potential for spread of the pathogen via root grafts. This could be accomplished by removing green POC from around the periphery of disease centers. This would accomplish two objectives. POC populations would be separated into populations of infected and uninfected POC, and the possibility of locating resistant POC within the infested areas would be retained. The possibility exists that girdled POC or severed POC stumps may remain alive due to root grafting. However, it has been shown that most roots not directly involved with root grafts die (Bornamm, 1966). Therefore, even if the severed or girdled POC stumps remain alive, benefit can be achieved by reducing the receptive sites for *P. lat.* (Gordon, 1974).

The emphasis in LSRs is not on timber as a commodity. It is recommended that POC harvest or salvage occur only after realizing other resource objectives which might benefit from large woody material input from POC. Snags can serve a variety of purposes for wildlife including, but not limited to, nesting platforms, feeding substrates, and roosting sites. While the decay rate of POC snags is not clear, a related species, western red cedar, has been shown to be the most persistent snag in forests of Coast Range (Cline, 1977). While this may provide for long-term utilization of POC snags for the uses previously mentioned, slow decay rates may reduce the opportunity for cavity nesters to occupy POC snags. Wildlife use of POC snags appears not as high as that of pines or Douglas-fir, but this is likely partially offset by the longevity or the snags (Jimerson, 1989). The level of large woody material input from POC will have to be determined through an interdisciplinary analysis and occur on a site-specific basis.

Preliminary data from USFS ecology plots in the POC series shows that while stands have the potential to become dominated by POC, there are generally other conifers and hardwoods present that contribute to stand structure and canopy closure (Atzet and McCrimmon, 1992). Data combined from all the plots in the POC series indicated that POC is normally not the dominant tree in those stands. If this situation exists, then removal of the live host of *P. lat.* may be possible without significant loss of canopy cover in the POC series that occur in spotted owl habitat.

3. Matrix

Most timber harvest and other silvicultural activities will be conducted in that portion of the Matrix with suitable forest lands (USDA-USDI, 1994). Stands in the Matrix can be managed for timber and other commodity production, but they also have an important role in maintaining biodiversity. Silvicultural systems for stands in the Matrix should provide for the retention of old-growth ecosystem components such as large trees, snags and down logs, and depending on site and forest type, a diversity of species (Thomas et al., 1993). Green tree retention is a significant component in the management of Matrix lands. Green trees can be retained, both as individuals and in well-distributed patches. Patches of green trees of various sized, ages, and specie swill promote species diversity and may act as refugia or centers of dispersal for many organisms including plants, fungi, lichens, small vertebrates, and arthropods (Esseen et al., 1992). Patches of green trees may also provide protection for special microsites such as seeps, wetlands, and rocky outcrops.

POC should be treated the same as any other commercial species in the Matrix. Special considerations for this species are identified later in the document (see following Mitigating Measures for Timber Sale and Service Contractors). Rather than girdling and leaving POC as mentioned above in the RRs and LSRs, merchantable POC can be removed for commodity production. It is recommended that areas of *P. lat.* be targeted for POC harvest. Residual uninfected POC can be left as part of the green tree retention previously described. Slashing of small POC and prescribed fire may be used to eliminate unmerchantable POC from infested areas. This removal of the host species could reduce the presence of *P. lat.*; and if POC is eliminated from a diseased site for more than 5 years, there is the potential for *P. lat.* to die out. This 5-year-time-period is for the drier portions of the POC range. More mesic sites, such as those found in the Coos Bay District, will require a longer period of POC absence in order for *P. lat.* to die out.

Monitoring will be essential to track the existence of *P. lat*. One potential monitoring technique is to plant small quantities of POC in areas suspected of still being infested. This could be done as a cluster plant with other species not susceptible to *P. lat*. If the disease is still present, mortality in the POC would show up quickly and could be documented in stocking surveys at the end of the first growing season. If no POC mortality occurs, the excess conifers resulting from the cluster plant could be removed (Viets, 1993).

D. Provide POC as a primary forest product.

POC can be exported as whole logs from Federal lands. A species can be exported if it can be shown that domestic use of the timber is absent or minimal (Land, 1992). Hinoki *(Chamaecyparis obtusa)* is used in the construction of homes and temples in Japan. Due to decreasing populations of hinoki, the demand for POC has increased. Five dollars per board foot or $5,000 per thousand have been paid for POC (Brattain and Stuntzer, 1994).

Matrix lands infested with *P. lat.* should be targeted for salvage operations as soon as possible. Reserves should be considered for salvage only after the appropriate analysis has been completed (watershed analysis for RRs or management plan for LSRs). It is recommended that mortality salvage operations occur within 3 years of the death of any POC in the Matrix, and as soon as possible in other areas as long as the salvage is consistent with management objectives. The export value of POC was reduced after 3 years due to a decrease in grade (Zobel et al., 1985). This contrasts with POC killed by fire. Fire-killed trees can retain their merchantability for a longer period of time due to exterior charring. In addition to salvage, green POC should be removed from around the infested area to reduce the possibility of disease transmission via root grafts. The distance for removal of POC would have to be determined on a site-by-site basis.

Areas not infested by *P. lat.* need not be off limits to timber harvest. However, steps must be taken to reduce the probability of initial infection. Mitigating measures for timber sale and service contracts are listed in Section VI below. It is anticipated that a helicopter would frequently be the logging system of choice, but conventional systems could also be used when they are consistent with management objectives for the area.

E. Public Involvement

Public education and media involvement should be incorporated into our guidelines. Groups such as the Oregon Natural Resource Council, the Western Environmental Law Center, Inc., the Siskiyou Regional Education Project, the Nature Conservancy, and the Sierra Club have indicated interest in POC management. Involvement and coordination with private landowners and other neighbors will provide better awareness of *P. lat.* problems, reduce the potential for new *P. lat.* infections, and help organize the management of POC and *P. lat.* across ownerships. Upon adoption of a rangewide POC management plan, a news release could be issued to the media. There has already been interest shown by members of the press as the information regarding Pacific yew susceptibility to *P. lat.* has become more widely known. Educational signs identifying road closures for POC and *P. lat.* management should be posted in all areas containing POC. Lectures to interested groups could also enhance the image of the BLM POC management program. A brochure similar to the USFS pamphlet, Port-Orford-Cedar Root Disease (FPM Report #294), should also be developed by BLM.

F. Develop a budget and implementation schedule for the POC Program.

POC areas should be mapped, and lists of the Operations Inventory Units containing POC should be developed. The next step is to develop lists of infested and uninfested areas containing POC.

Without an accurate inventory of POC and *P. lat.* occurrence, successful management of POC and *P. lat.* has little chance of success. The suggested procedure is as follows:

| | |
|---|---|
| Inventory | General survey for POC and *P. lat*.<br><br>Determine the extent of the POC and *P. lat.* (Are all POC infected?). Map areas with and without *P. lat.* |
| Implementation Plan Develop | M*S and GIS: Input data into MICRO*STORMS and GIS. Development GIS maps of POC and *P. lat.* areas and input recommended treatments into M*S database. |
| Plan Monitoring, Ongoing Adaptive management, and Modification | |

Future needs will focus on developing site-specific management plans for all areas containing POC, and monitoring POC areas to see if the disease has been isolated or eliminated from infected areas and fprevented from spreading into disease-free areas.

## VI. MITIGATING MEASURES FOR TIMBER SALE AND SERVICE CONTRACTS

It appears that when areas of POC and *P. lat.* are accurately mapped and mitigation measures are implemented, the successful spread and establishment of the disease into new watersheds is a rare event. The use of effective mitigation measures, combined with a low risk of establishment following the spread of the disease, has prevented the spread of the disease into uninfested watersheds in California (Kliejunas, 1991).

A. Restrict road building and log hauling to the dry season unless the contract calls for cleaning the vehicles to prevent/reduce import or export of the root disease. This will lessen the chance of infested soil adhering to equipment and vehicles and consequently from being transported to uninfested areas.

B. Road design: When feasible, outslope the roads or use crushed rock to keep the soil in place. A slight outslope is best as the soil landing on the fill slope has a low probability of ending up in streams. Insloped roads will cause soil to end up in the ditch and eventually enter into streams, placing downstream POC populations in jeopardy. Culvert and waterbar placement should also divert water from areas where POC exists.

C. In POC areas, do not allow blading into road ditches upstream from the uninfested areas. Blade to the fill slope only. Do not allow sidecasting where sidecast material could reach the stream channel.

D. Wash with chlorine bleach and water or require steam cleaning or high pressure water treatment for all machinery and vehicles prior to entry into the uninfested project areas. Require the same washing and cleaning for machinery and vehicles prior to departure from infested sites. The ration of chlorine bleach and water for vehicle washing is 12 ounces of bleach per 1,000 gallons or water. Charge the vehicle cleaning to the timber sale or whatever activity requires entry into the POC area. See Appendix 2 for additional information.

E. Gate or barricade roads in areas containing POC, both uninfested and infested, when consistent with other resource objectives. This prevents vehicle introduction of *P. lat.* into uninfested areas and the transport of *P. lat.* out of infested areas. Lack of access also reduces the potential for theft and can be incorporated into the resource area road closure policy designed to benefit resources other than timber such as terrestrial wildlife, fisheries, and other values identified as part of the Aquatic Conservation Strategy.

F. In timber sales containing infested and uninfested areas, harvest uninfested areas first so that the equipment does not become contaminated and the contamination moved to uninfested areas.

G. Use chlorine bleach and water or steam cleaning to wash chokers and equipment if a helicopter yarding system is used.

H. Have an interdisciplinary team review and make recommendations to the area manager on all activities in POC areas. Fisheries projects, riparian enhancement, and recreation site development are examples of undertakings that should have interdisciplinary team review.

I. Remove the belly plate from all tractors that have worked in infested areas, and steam clean or wash the tractors with chlorine bleach and water prior to leaving the site. In uninfested areas, steam clean or wash all skidding, yarding, and hauling equipment prior to entering the site. See Appendix 3 for specific vehicle parts that may require cleaning.

J. Do not allow POC bough cutting until the following steps are completed:

1. Inventory for POC and *P. lat.*
2. Determine if bough cutting is consistent with management objectives for the area.
3. Only allow bough cutting in small areas where administration and law enforcement have easy access.

K. Develop monitoring plans for all POC areas. This could include such things as checking contract diaries for rainfall events during logging and activities outside of the scope of the contract.

L. Coordinate with the USFS, state and county forestry departments, private groups, and individuals that have an interest in POC management.

M. Require roadside brushing: (all distances are slope distances)

1. Upslope: Cut all POC within 20 feet of the road edge; if cut slopes are greater than 5 feet in height, remove POC only between the road edge and the top of the cut slope.

2. Downslope: All POC within 50 feet of the road edge, downslope from the stream crossing, and all POC that have roots within the stream channel should be killed where the stream channel intersects the road right-of-way.

These disturbances are used as examples and can be modified to fit a particular situation. In addition, this is not mandatory and should only be used when there is a high likelihood of importing *P. lat.* into a project area where other mitigating measures have low potential for success.

N. Reforestation: Plant POC at 25-foot spacing or in approximately 10-tree clusters at 100 to 150 foot spacing. This does not apply to planting mentioned above where presence of *P. lat.* is being determined.

O. Precommercial thinning: Allow for adequate spacing between POC in precommercial thinning contracts. This will lessen the chance of root grafting and potential pathogen transmission. Use 25 feet as a spacing guideline in precommercial thinning.

P. Commercial thinning: Allow for adequate spacing between POC in commercial thinning contracts. Use 50 feet as a spacing guideline in commercial thinning sales. This will lessen the chance of root grafting and potential pathogen transmission.

Q. Thinning can also be designed so that POC is left in tight clusters 100 to 150 feet apart. The intent is to minimize the potential for root grafting between clusters of POC.

R. Endhauling/slide removal: Prior to removing soil and other material, determine is either the source of the destination of the material is infested with *P. lat.*

# APPENDIX 1

## SYNOPSIS OF REGIONS 5 AND 6 PORT-ORFORD-CEDAR COORDINATING GROUP ACTION PLAN

A. INVENTORY AND MONITORING

Goal: Develop a standard inventory and monitoring system for regional use.

Action items/objectives:

1. Inventory to establish POC locations.
2. Inventory to establish current boundaries of infection.
3. Monitor to establish the rate of spread, locally and species-wide.
4. Evaluate the effects of mitigating measures.

B. RESEARCH AND ADMINISTRATIVE STUDY

Goal: Develop a coordinated and prioritized approach to administrative studies and encourage research by other parties that is responsive to the management of POC.

Action items/objectives:

1. Test strategies of control for efficacy.
2. Encourage research units to initiate studies on identified research needs in the following priority:
    a. Develop methods to detect the pathogen in soil and water.
    b. Determine the requirements of the pathogen for survival and dispersal.
    c. Study measures to eliminate the fungus from areas of incipient infection.
    d. Investigate the existence of resistance to the pathogen within the range of POC.
    e. Determine to what extent genetic variation exists in POC.

C. PUBLIC INVOLVEMENT AND EDUCATION

Goals: Develop a coordinated regional effort to keep the public informed of the progress of POC management and incorporate public involvement in the process.

Action items/objectives:

1. Keep interested groups up-to-date on the progress of POC management.
2. Provide opportunities for interested groups and individuals to contribute to the coordinating team.

## D. MANAGEMENT

Goals: Develop an agreed-upon and coordinated program to manage POC in the presence of root disease and generate criteria and mechanisms to determine the risk of spread.

Action items/objectives:

1. Continue to refine and update the risk assessment model used in evaluating projects.

2. Develop strategies for the management of the following activities:

    a. Timber sales

    b. Road construction and management

    c. Reforestation and stand management

    d. Other activities that have potential for earth-moving activities (such as quarry development) in stands containing POC.

3. Develop a system or method for sharing information.

# APPENDIX 2

## GENERAL SPECIFICATIONS FOR A WASHING STATION

**Purpose:** The purpose of the washing station is to remove as much soil and organic matter from vehicles as possible to prevent/reduce the spread of *P. lat*. Vehicles and equipment should be sanitized prior to entering uninfested areas and prior to departure from infested areas. The intent is to reduce the spread of *P. lat.* into uninfested areas. Sanitation can be accomplished with a mixture of chlorine bleach and water or by steam cleaning. The ration of chlorine bleach to water is 12 ounces of bleach per 1,000 gallons of wash water.

When locating and constructing a washing station to clean vehicles and equipment, we need to minimize the chance that a “clean” truck will be re-exposed to infested material near the washing site. There are two ways this can happen. One is if the truck travels through an area where “unclean” trucks are also traveling. This can be minimized by proper location of the washing station. If some common travel ways are used, efforts need to be made that will reduce the chance of picking up soil. This can be accomplished by rocking the common road surface or hardening it in some other fashion. Reducing the amount of water used for dust abatement will lessen the amount of mud which may also prove useful.

The second way a “clean” truck could become a carrier again is by traveling through wash water and mud at the washing station. Proper construction of the site will eliminate this risk. Runoff of the wash water needs to drain away from the wash site and away from the travel route to and from the site. Wash water must not be allowed to drain into stream channels. The actual washing site needs to be elevated so that the trucks are not sitting in mud and wash water. This could be accomplished by ramps or by building a sufficiently high rocked surface on which the trucks can travel. The length of the rocked surface wash area should be at least 1.5 times the length of the trucks that will be using it. This will allow the trucks to travel on a non-contaminated surface for a short distance after being washed and reduce the chances of picking up infested soil from the washing. The gravel used for rocking should be of sufficient size to allow good percolation of water and soil into the subsurface. Accumulations of water and soil on the surface should be avoided. This last point also affects the depth of the rocked road surface. The amount of washing and the number of trucks using the site will also influence the depth.

The type of equipment used for washing needs to be sufficient to remove all soil and organic matter that is clinging to the trucks. The actual water pressure required can best be determined on the site. Each time a truck enters an uninfested site, it needs to be washed.

# APPENDIX 3

## EQUIPMENT CLEANING CHECKLIST

The purpose of this checklist is to provide guidance to contract administrators in the enforcement of equipment cleaning contract provisions for *P. lat.* control. This is a guide to direct administrators to specific areas on equipment that are likely to accumulate soil and should be check. Onsite judgments still need to be made about overall equipment cleanliness. This will be a new procedure for many purchasers and they need to be convinced of the seriousness of the situation prior to beginning the contract. Effective enforcement procedures (such as shutdowns) must be available to the contract administrator.

Does the equipment appear to have been cleaned?

Is the equipment clean of clumps of soil and organic matter?

| **RUBBER-TIRES VEHICLES** | **TRACK-LAYING VEHICLES** |
|---|---|
| Tires | Tracks |
| Wheel Rims (underside and outside) | Road Wheels |
| Axles | Drive Gears |
| Fenders | Sprockets |
| | Roller Frame |
| | Track Rollers/Idlers |

**ALL VEHICLES AS APPROPRIATE**

Frame or Undercarriage
Belly Pan (inside)
Stabilizers (jack pads)
Grapple and Arms
Dozer Blade or Bucket and Arms
Ripper
Brush Rake
Winch
Shear Head
Log Loader
Water Tenders (empty or with treated water)

# APPENDIX 4

## PROJECT ANALYSIS AND IMPLEMENTATION

(from the USFS POC Action Plan)

**Threshold of Concern:**

| | RISK | | |
|---|---|---|---|
| % of POC | Low | Medium | High |
| Low (0 to 5%) | No concern | No concern | High concern |
| Moderate (5 to 20%) | No concern | High concern | High concern |
| High (>20%) | High concern | High concern | High concern |

**Defining Risk:**

| | |
|---|---|
| Low | Below roads: No POC within 500 feet.<br>Above roads: No POC within 50 feet. |
| Moderate | Below roads: POC may be within 100-500 feet of the road.<br>Above roads: No POC within 50 feet. |
| High | Below roads: POC within 100 feet.<br>Above roads: POC within 50 feet. |

Objective A: Prevent/reduce the import of disease into uninfected areas.

Objective B. Prevent/reduce the export of disease to uninfected areas.

Objective C: Minimize increases in the level of inoculum or minimize the rate of spread in areas where the disease is endemic. If possible, identify the probable mechanism of spread; whether by introduction of spores or by root grafting.

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# Appendix 2: Summary of Agency Actions for Fiscal Years 2001 and 2002 Under the Existing Direction for Port-Orford-Cedar

This information is presented to help guide assumptions about how the No-Action Alternative is expected to be implemented. Although the No-Action Alternative generally relies on site-specific analysis to select management actions from a menu of possible actions to meet an overall objective, a reasonable assumption about the future level and intensity of management actions can be made by examining what the Agencies have done under this direction in the past. The effects of the No-Action Alternative (Alternative 1) described in Chapter 3&4 and summarized in Chapter 2 are based in part on recent accomplishments noted in this appendix, and an expectation that a similar scope and intensity of management practices will continue.

## Overview of Current Port-Orford-Cedar Program Implementation

In May 1987, and interregional Port-Orford-cedar (POC) Coordinating Group was formed by the BLM and FS. This group continues to serve as a programmatic technical coordination team composed of the BLM POC Coordinator, FS POC Manager, pathologists, ecologists, and geneticists, as well as administrative unit representatives from Oregon and California.

The existing POC program is basically made up of five efforts on the part of the Federal agencies: (1) decreasing the spread of the disease, (2) increasing the survival of the host, (3) producing valued by-products from its treatment, (4) considering potential impacts on other forest activities resulting from implementing *Phytophthera lateralis* (PL) mitigations, and (5) monitoring and communication.

**1. Decreasing Spread of the Disease**

**A. Roadside Sanitation:** The removal of roadside POC is a technique to prevent/reduce new infections along roads in currently uninfested areas, or if already infested, minimizing the amount of inoculum available to be transported to other uninfested road segments. Both agencies are currently using this tool in certain, site-specific forest projects. Treatment width varies in its application.

**B. *Phytophthora lateralis* Eradication:** By using a combination of treatments (such as removing the host, opening a stand to direct sunlight, using fire to lessen the amount of PL in soil, and planting different replacement species), PL may be eliminated from treatment areas eventually allowing POC to reestablish. Because its effectiveness has not been proven over the long term, neither agency is currently utilizing this technique.

**C. Improve Roads to Decrease Risk, Especially within Key Habitats:** Both agencies attempt to upgrade roads on a site-specific project basis to minimize movement of the pathogen on forest roads. Available funding, however, frequently limits this technique.

**D. Water Sources:** Water is frequently used in many forest activities, including road construction, dust abatement, and fire control. Water sources, however, may be contaminated with PL and the pathogen may be spread across the forest environment by the movement of water. Federal agencies have recommended and widely implemented treating such water with chlorine bleach and have largely mapped possible contaminated water sources within the range of POC. However, keeping maps of uninfested water sources current is not always possible with limited resources.

**E. Road Design and Maintenance:** Few forest roads are being built within the range of POC on Federal lands because of listed fish species and the decline in timber harvest levels. New road design specifications for sloping and surfacing have been implemented using recommended transportation management objectives when feasible. Existing Federal forest roads are continually being evaluated on a project basis for various treatments including upgrading surfacing, gating, or closing.

**F. Road Use Restrictions:** Although not always desirable or possible, closing or gating roads are effective methods for limiting the introduction of the disease.

**G. Washing Vehicles:** Even though washing can be a successful treatment for lessening the amount of PL spread across forest environments, it is difficult to apply efficiently. Realistic locations for installing washing stations are often not available, and control of use (who and when) is not always an option because of right-of-way permit requirements.

**H. Restricting the Sale of Forest Products:** Some administrative units have noticed a correlation between the sale and harvest of POC boughs and the spread of PL. These units have restricted or discontinued the sale of POC boughs.

**2. Increasing Survival of the Host**

**A. Resistance Breeding:** Based upon general forest resource management objectives to promote and sustain forest health, biodiversity, and productivity, the FS and BLM have both committed time and funding to a resistance breeding program currently underway at the FS Dorena Genetics Resource Center located at Cottage Grove, Oregon. Related research is also being conducted at Oregon State University in Corvallis. A 5-year memorandum of understanding was recently signed between the two Agencies to continue interagency support for the POC breeding program (see additional details below).

**B. Plant Spacing:** Because so few reforestation projects were done in the past, spacing of POC seedlings was not a consideration. But with large reforestation stock needs resulting from large fires such as the Biscuit Fire, seedling needs will increase. Individual POC seedlings are planted at a 25-foot spacing or in clusters 100- to 150-feet apart.

**C. Precommercial and Commercial Thinning Spacing:** Provisions of precommerical thinning contracts usually include requirements for leaving POC as leave trees whenever possible and creating wide distances between them. Federal commercial thinnings have also been implemented using recommended spacing guidelines, or have been used to remove POC growing adjacent to roads in or on the perimeter of treatment areas.

**3. Producing Valued By-Products from Treatments**

**A. Bough Sales When Sanitizing:** Harvesting boughs from POC trees that have already been cut during roadside sanitation treatments is currently being conducted only on the Medford District of the BLM.

**B. Snag/Coarse Woody Debris Retention:** Both agencies are following general snag and coarse woody debris retention direction of the "Northwest Forest Plan" (1994). POC is not specifically identified as a species targeted for retention.

**C. Non-Port-Orford-Cedar Special Use Permits and Other Collections:** Both Agencies issue and promote special use permits for the harvesting of other special forest products. Some examples include the sale of non-POC boughs, beargrass, and the collection of cones. The actual harvest of these commodities, however, sometimes involves using forest roads during wet periods and, if not closely regulated, may take place in infested areas. Agency responses have typically been to prohibit special use permits on infested sites on a seasonal basis. It should be noted that noncompliance of the conditions of the special use permits and limited law enforcement abilities or contract oversight frequently allow the opportunity for spread of PL on forest roads. Aggregate material is also routinely sold by both agencies, sometimes where the material may be contaminated with PL.

**4. Potential Impacts on Other Forest Activities Resulting from Implementing *Phytophthora lateralis* Mitigations**

**A. Mining:** Activities likely to cause significant disturbance of surface resources require a plan of operation, leading to Agency requirements for reasonable terms and conditions. Mining operators can be required to follow the same mitigation techniques as the Agencies require of themselves, contractors, and pemittees.

**B. Incorporating Port-Orford-Cedar Concerns When Planning Other Projects:** The geographic information system (GIS) is the basic planning tool used for identifying currently known locations of both POC and PL in relation to proposed project locations. Other ongoing programs, such as the issuance of special use permits, consider these actions and the possible spread of the disease. POC concerns are also identified in agency transportation management plans and are considered in relation to possible road management activities, including road construction, maintenance, and use.

**5. Monitoring/Education**

**A. Monitoring:** Within the FS, implementation and effectiveness monitoring of POC projects are conducted in accordance with respective land and resource management plans. Elements of FS monitoring programs may include conducting annual surveys for identifying new locations of POC root disease, estimating overall trends of rates of spread of the disease, evaluating the risk of spread for proposed projects and follow-up after project completion, and collecting data to estimate intensity of infested areas. For the three BLM districts, resource management plans require all projects to conform to the "Port-Orford-Cedar Management Guidelines" (1994). These Guidelines state that when inventorying POC and PL areas, effectiveness of management of the pathogen and disease control should be monitored for at least 5 years in the drier portion of the range of POC and for longer periods where climatic conditions are wetter. Both agencies have sometimes not met timing recommendations for reinventorying locations of POC and PL.

**B. Public Education:** The FS and BLM have prepared a POC communication plan. The plan identifies specific methods for possible education efforts including press releases, posters and pamphlets; public field tours; presentations to user groups; a POC Newsletter; coordination with Tribal groups; creating POC internet websites; conducting public symposiums; preparing and installing information signs on trailheads, gates, and other closures; holding coordination meetings with industrial and small woodland landowners; and supplying maps of road closures. Actual implementation of these tasks varied widely depending on available staff time, budget, or legal constraints.

## Existing Programmatic Actions

### Interagency Port-Orford-Cedar Breeding Program

The FS and BLM are supporting an ongoing program at the FS Dorena Genetic Resource Center in Cottage Grove, Oregon, to identify the amount and type of genetic resistance in natural populations of POC to the introduced PL pathogen. Wild, individual trees are selected to test for genetic resistance, with the goal to produce resistant seed to restore and sustain POC and its function in the ecosystem. First priority for resistant seed are Federal and cooperating agencies, but some seed has recently been made available to other growers.

With assistance from Oregon State University, work is continuing to develop durable resistance (that is to survive long term) while retaining the broad genetic diversity within the species. Over 11,000 field selections throughout the POC range have been made. Using a stem inoculation technique, limbs (approximately 12-inches long) are collected from each of the trees and six of these branches are then screened for resistance to PL; the trees highest rated with this technique are now being retested by a root inoculation technique using rooted cuttings or seedlings grown from seed collected from the candidate tree to help refine the results of the initial screening.

Other elements of the POC program involve propagation; growing, cultivating, and maintaining containerized trees; breeding; seed production; evaluation using validation plots; analysis; data management; record keeping; and technology transfer.

Because POC bears cones at age 4 or 5 when intensively managed, the program is advancing quickly from resistant orchard trees and the opportunity now exists to use this seed in some breeding zones. Resistant seed is being sown in early 2003 to be used to restore areas burned in the Biscuit Fire on the Siskiyou National Forest (NF).

### Agency Wildfire Management Implications

Firefighting activities have commonly involved the use of water for suppression purposes and the use of vehicles to transport people and equipment within and around the fire perimeter. Prior to the fire season, the FS and BLM have both inventoried and updated possible water sources and have identified potentially infested water sources. When a wildfire breaks out, this information has been communicated to fire resource advisors and, when safely possible, the use of either uninfested or treated water has been encouraged. If present, propagules of the pathogen can be killed in contaminated water by treating it with chlorine bleach. Frequent and strategic washings of fire vehicles and equipment have also been recommended.

## Updating Mapping of Port-Orford-Cedar/*Phytophthora lateralis* Locations

From 1990 to 1996, the FS and BLM took up the substantial task of initially mapping range-wide on federally-administered lands with known and recently observed locations of both POC and PL. Utilizing existing data, road surveys, aerial photo interpretation, and annual aerial surveys, maps were compiled and transferred to GIS and are now available at both the administrative-unit and range-wide scale. In Fiscal Years 2001 and 2002, changes have been noted and geographic information system layers have been revised as needed. This spatial and temporal information is now routinely used for project planning.

## Specific Actions by Administrative Unit

**Siskiyou National Forest.** The Siskiyou NF recently issued a POC policy that recommended to employees, contractors, and the general public, when in areas within the range of POC, to use a range of mitigation actions to reduce the risk of import, export, or spread of PL. Actions recommended included washing vehicles prior to entering any areas of uninfected POC on NF lands, avoiding use of roads closed or gated for POC protection, and cleaning footwear when work is completed in infested areas.

In Fiscal Year 2001, the Siskiyou NF reported programmatic funding of approximately $238,000 for a POC manager to serve all NFs within the range of POC, as well as district or zone POC coordinators, printed educational materials, and other supplies.

The Forest tracks individual projects that were active within the range of POC and, by each respective activity, reports implementation of disease control efforts and their success in discouraging the spread of the disease. Broad categories used are engineering and road management, timber harvest, and stand management actions.

Firefighting operations on the Biscuit Fire that occurred on the NF in the summer of 2002 included efforts to minimize spread of the root disease. Management actions taken, when safely possible, included daily washing of vehicles and equipment, and treating water with chlorine bleach. Approximately 26,700 gallons of chorine bleach were used on the fire and subsequent rehabilitation efforts.

**Six Rivers National Forest.** A biannual aerial detection flight conducted in Fiscal Year 2001 discovered a new root disease location and the road was closed and access restricted. No other new infections were reported.

In Fiscal Year 2002, the Six Rivers NF conducted a presuppression assessment ($20,000), closed a road, built a trail and moved a trail, and conducted surveys to move other trails into three natural resource areas ($32,310), and removed POC growing alongside forest roads ($8,000).

The Six Rivers NF also has a common garden study site located at the Humboldt Nursery facility, and the Forest has actively relocated trails and trailheads because of PL concerns, instituted an active roadside sanitation program, installed a wash station at Orleans, California, developed a public education program, and installed and maintained POC resistance trials at two sites.

As on the Siskiyou NF, firefighting operations on the Biscuit Fire that occurred in 2002 included efforts to minimize spread of the root disease. Management actions taken, when safely possible, included daily washing of vehicles and equipment, and treating water with chlorine bleach.

**Shasta-Trinity National Forest.** POC root disease was confirmed to be on the Shasta-Trinity NF in 2001. The Forest incorporates POC management considerations into all of its management activities. Eradication treatments are scheduled to take place in 2003. Routine actions, when vegetation management is practiced where POC occurs, include detections, evaluation, and control of pest-caused damage. As an example, in Fiscal Year 2002, the Forest relocated and improved many road crossings ($20,400) as part of an active program to identify and address sites that are at high risk for introduction of PL. The Cedar Basin Research Natural Area is also actively managed to exclude the pathogen—inland POC populations there are genetically and ecologically distinct from coastal populations.

A large common garden study site on the Shasta-Trinity NF near Weaverville, California, is maintained and evaluated by the Forest to determine the physiological and genetic variation traits of the species.

**Klamath National Forest.** PL does not currently occur on lands administered by the Klamath NF, although there are many stands of POC. In Fiscal Year 2002, the Klamath NF provided $4,000 for field collections of vegetative material in support of the POC genetics program. The Klamath NF instituted and maintains roadside sanitation zones along Grayback Road and other areas, maintains an active disease monitoring program, and incorporates POC management considerations into all of its management activities.

**Coos Bay BLM.** Because the disease has been present on these federally-administered lands for the longest period of time (50 years) and its presence is pervasive across the Coos Bay District, effectively controlling the spread of the disease is especially difficult. Also, because of the BLM's system of existing reciprocal right-of-way agreements with private parties, road treatments and control are often not possible. The Coos Bay District implemented some road treatments in Fiscal Year 2001 which included roadside sanitation when practical, washing of vehicles (seasonally), closing selected roads, summer hauling on dirt roads, and prohibiting the cutting of POC boughs.

Because the disease has been present in this location for a long period of time, individual wild trees have also had the greatest opportunity to express genetic resistance (usually indicated by healthy POC surrounded by dead or dying POC). A large number of such trees from this District have tested positively for resistance and are now represented in the genetics program.

It is estimated that 80 percent of all green, living POC trees on the Coos Bay District are scattered and well-distributed away from streams and roads where mitigation measures are not needed. In these areas of low risk for infection, POC trees are expected to maintain their population. The District planted 2,000 nonresistant POC seedlings on acres of low-risk sites in Fiscal Year 2001, and 1,000 nonresistant POC seedlings on 150 acres of low-risk sites in Fiscal Year 2002.

**Medford BLM.** Management for POC during Fiscal Year 2001 and 2002 on the Medford

BLM District were in two broad categories. The first category involved the collection of information, monitoring of sites infested with PL and its spread, and the continuation of efforts involving resistance to the root disease represented by selecting and testing individual POC trees.

The second category of POC management was the physical management of stands. Projects included treatments such as roadside treatments that removed POC, pre-commercial thinning treatments where POC was thinned to a wide spacing to reduce the spread of the root disease through root grafts, restrictions (such as seasonal gates), limited bough collection from uninfested areas, and the creation of POC snags. Other projects, such as trail construction, were designed to avoid POC locations.

**Roseburg BLM.** The Roseburg District continues to implement a series of management actions including washing vehicles and seasonal-use restrictions on certain roads, and prohibiting such activities as bough collecting at certain times of the year.

In Fiscal Year 2001, other associated District programs included an active program of mapping new locations of the disease, removal of hosts next to roads, continued identification of genetically resistant trees, and pursuing a proposed land exchange that would protect a serpentine plant community with POC.

In 1997, a 10-acre site on the District was planted to study POC range-wide silvicultural and genetic characteristics. The site is continually maintained and the POC, which originated from varying locales from Oregon and California, are being evaluated.

# Appendix 3: Port-Orford-Cedar Standards and Guidelines in the Land and Resource Management Plans in Region 5 (SEIS Cooperating Agencies) and the Siuslaw National Forest

For reasons described in the Background section, management direction for the Klamath, Six Rivers, Shasta-Trinity, and Suislaw NFs is not being considered for change at this time. The current direction for these forests is held constant across all of the alternatives in the SEIS, and is only considered in the cumulative effects discussions in Chapter 3&4. The current POC management direction for these NFs is displayed in this appendix for reference.

## Existing Direction — Six Rivers National Forest

The following is from the "Six Rivers National Forest Land and Resource Management Plan" (1995).

TREES WITH SPECIAL MANAGEMENT CONSIDERATION

**[Page II-7]** Strategies for reducing the risk of infection or spread of the disease will be integrated into all levels of planning and analysis for all areas that contain Port-Orford-cedar (POC). A risk analysis will be completed for all projects in watersheds containing POC. The Forest is utilizing disease control strategies.

**[Page III-16**] POC will be managed according to the Forest plan Standards and Guidelines that should provide an opportunity to prevent the spread of the root disease. Opportunities may occur to reestablish POC in plant associations which have been altered by root disease.

**[Page III-16]** The Forest Service implements an integrated pest management approach to dealing with forest pests (such as root diseases) which includes prevention, detection, evaluation, suppression, and monitoring. Pest management goals are directed toward reducing pest-related losses to levels that maintain a healthy forest environment.

<u>Standards and Guidelines</u>

[Page IV-51] *Pest Management*

1. No management action should be taken against endemic insects or Forest pathogens unless it can be determined that their occurrence has been exacerbated by human activities or spread would significantly compromise the integrity of the [Special Interest Area].

2. In order to reduce the spread of POC root disease, a risk analysis will be completed for all projects in watershed containing POC.

3. Access and/or projects proposed in uninfected watersheds which have potential risk for infection shall have a risk analysis performed.

*Transportation and Facilities*

**[Page IV-53]** 7. To prevent the introduction of POC root disease into uninfested areas of the North Fork

Smith River Botanical Area, close Road 18N13 to vehicle access. Vehicle access into remaining areas (Road 18N09 and associated spur roads) is prohibited pursuant to 36 CFR 261.50; the prohibition exempts officials pursuant to 36 CFR 261.50(d)(4) and persons with a permit, special-use authorization, or operating plan, as defined in 36 CFR 261.2, issued by the District Ranger or higher-ranked authorized official. Access shall not be allowed during the wet season and during periods of heavy rain in the summer. If monitoring determines that these measures are not effective, additional mitigation measures will be considered and analyzed.

MANAGEMENT AREA 11-SPECIAL REGENERATION

*Pest Management*

**[Page IV-54]** 1. In order to reduce the spread of POC root disease, a risk analysis will be completed for all projects in watersheds containing POC.

FOREST-WIDE DIRECTION — PEST MANAGEMENT

*Pest Management Program*

**[Page IV-129]** *Goals:* Minimize resource damage from insects, disease, plants, and animals to help achieve resource objectives. Where this damage causes undesirable changes in vegetation, minimize resource damage through integrated pest management.

*Direction:* Of special concern to this Forest is POC root disease, *Phytophthora lateralis*. Special practices and monitoring are being implemented to maintain the viability of POC in the forest for genetic diversity, as well as economic and American Indian contemporary uses. Management is intended to be site specific, consistent, and visible to the public. Any activity that has a potential for spreading the root diseases fungus will require a formal analysis and prescription for controlling the spread of the fungus. This process is also required when Pacific yew is intermingled with POC or within the same project area as POC.

*Port-Orford-cedar Root Disease*

20-6: POC will be managed as a long-term component of plant associations where it is present.

20-7: Strategies for reducing the risk to POC from infection of the root disease will be integrated into all levels of planning and analysis (NEPA documents, watershed analysis, late-successional reserve assessments, wild and scenic river management plans, transportation planning, recreation planning and other activities or strategies) in all watersheds where it is present.

Transportation plans will evaluate the risk of spread of POC root disease through road upgrades, seasonal closures, permanent closures, maintenance, and decommissioning or obliteration.

Recreation plans will also evaluate the risk to POC and address access, trail, and road use for recreational purposes.

20-8: In order to reduce the spread of POC root disease, a risk analysis will be completed for all projects in watersheds containing POC. Disease control strategies identified from experience and research will be applied on a site- or drainage-specific basis to prevent or if the disease is present, reduce the spread and severity of the disease.

**[Page IV-130]** 20-9: Information concerning POC root disease, its spread and prevention, will be provided to the public.

20-10: Proactive disease prevention measures such as road closures, road maintenance, and sanitation removal of roadside POC will be undertaken to help prevent the spread of the disease, especially to high-risk areas. Prevention measures would be identified at a site-specific or drainage-specific level through environmental analysis.

IMPLEMENTATION, MONITORING, EVALUATION, & AMENDMENT

*Forest Pests & Diseases*

**[Page V-20]** *Effectiveness monitoring questions:* Are applicable mitigations and management strategies preventing/minimizing significant damage or growth reductions from destructive insects or diseased on the Forest, including POC root disease?

*Sampling methods and intensity:* (1) Routine sampling during stand exams and reforestation surveys; and (2) biannual aerial detection surveys, plus intensive sampling of road systems infected by POC root disease.

*Threshold of concern and responsible staff:* (1) Pathogen or pest levels indicate potential for damage or growth loss in 15 percent of samples; (2) detected acceleration of POC root disease spread; and (3) SO [supervisor's office] and District silviculturists.

APPENDIX H

*Pests: Port-Orford-cedar:*

**[Page H-9]** *Monitoring purposes:* (1) Determine infected locations, rates of spread and overall trends of POC root disease; and (2) evaluate effectiveness of strategies to control spread of the disease.

*Threshold of concern/Variability:* Measured acceleration or deceleration of spread as an indicator of positive or negative effectiveness of control strategies.

*Data collection:* Conduct aerial photographic inventories to identify healthy and diseased stands. Intensively sample infected road systems to determine the extent and rate of spread of POC root disease along transportation routes. Regularly scheduled reforestation surveys after the first, third, and fifth growing seasons will indicate performance in plantations. Perform aerial detection surveys at least every two years to indicate spread along streams and roads and within forest stands. Research will be initiated to measure genetic diversity, develop disease-resistant trees, and evaluate methods of control.

*Responsibility:* Forest ecologist and Forest and District silviculturists.

APPENDIX K – PORT-ORFORD-CEDAR ACTION PLAN

**[Page K-4]** Control Strategy—Project analysis and Implementation

The following is an outline format to be used to complete a risk analysis for all projects in watersheds containing POC. Disease control strategies will be applied as appropriate on a site or drainage-specific basis to reduce the spread and severity of the disease.

| | | Risk (concern) | | |
|---|---|---|---|---|
| | % of POC | Low | Moderate | High |
| IMPACT | Low (0–5) | Low | Low | High |
| | Moderate (5–20) | Low | High | High |
| | High (>20) | High | High | High |

*Defining Risk*

Low—Below roads, no POC within 500 feet; above roads, no POC within 50 feet.

Moderate—Below roads, POC may be between 100 and 500 feet of the road; above road, no POC within 50 feet.

High—Below roads, POC within 100 feet; above roads, POC within 50 feet.

*Potential Project Objectives*

Objective A: Prevent the import of disease into uninfected areas (offsite spores picked up and carried into uninfected project area).

Objective B: Prevent the export of disease to uninfected areas (onsite spores moved to offsite uninfected area).

Objective C: Minimize increases in the level of inoculum or minimize the rate of spread in areas where the disease is endemic or infection is intermittent. If possible identify the probable mechanism of spread; whether by introduction of spores or by root grafting.

*Threshold of Concern Assessment*

The assessment will discuss the level of concern regarding the project, the causes for concern, specific areas of concern and possible treatments to preclude the level of risk. The following is a list of possible treatments.

*Disease Control Strategies*

Engineering and Road Management [E]

E-1: Road locations should be made, when possible, below cedar areas or on opposite sides of ridges.

E-2: Control drainage from roads so that it is dispersed to the maximum extent feasible through outsloping and/or frequent ditch relief. Where not feasible, drainage should be concentrated into existing stream channels.

E-3: Locate and design waste areas so they do not spread infection spores.

E-4: Limit road construction to the dry season.

E-5: Machinery and vehicles working and traveling on road prior to establishment of final drainage need to be washed before entering project.

E-5A: Machinery and vehicles working and traveling on road prior to establishment of final drainage need to be washed before entering project. Trucks end-hauling material to waste areas may be exempted provided no infected toads or sites are traveled between the project and the waste area.

E-6: Wash equipment before leaving infected areas.

E-7: Close roads with guardrails, physical blockages or "putting to bed." Maintenance and enforcement is included.

E-7A: Close roads with guardrails, physical blockades or "putting to bed" in order to restrict product utilization and management activities in the dry season (June 1 through September 30). Maintenance and enforcement are included.

E-8: Avoid dust abatement with potentially infected water or treat water with chlorine.

E-8A: Avoid dust abatement and compaction with potentially infected water or treat water with chlorine.

E-9: Maintenance activities should avoid spilling rock on outside or downslope side of the road. As needed, blading shall be kept within 2 feet of the road edge to better achieve this.

E-10: Where conditions permit, inslope the road template and establish berm on the outside edge of the road to prevent downslope flow of contaminated water.

E-10A:  For maintenance purposes, where conditions permit, establish berm on the outside edge of road to prevent downslope flow of contaminated water.

E-11:  Establish road rules to prevent timber haul during periods when spores will be spread widely.

E-12:  Dump fill and debris from infested culverts and ditches in safe areas to avoid spreading the fungus.

E-13:  Establish road surface blading requirements to maintain a specified road template during maintenance operations.

Timber Harvest [T]

T-1:  Limit the operating season of timber sale operations to the drier months.

T-1A:  Limit the operating season of timber sale operations to the drier months (June 1 to September 30); discontinue operations during periods of rain or wet weather (C6.315: Limited Operating Season).

T-2:  Wash logging equipment before operating away from landings and roads.

T-3:  Constrain timber haul so trucks do not travel from infected areas, contaminating the latter.  Harvest the units in priority order to minimize the spread of spores to uninfected areas.

T-4:  When feasible, plan downhill logging to avoid road construction above uninfected stand.

T-5:  Use helicopter logging to protect high value cedar stands.

T-6:  Use service contracts to harvest timber with more control of activities.

T-7:  Wash logging equipment working in infested sites before it is moved off site.

T-8:  Wash logging equipment, other than log trucks, prior to entering sale area.

T-9:  Wash log trucks and other equipment when moving from infected to uninfected areas during wet weather.

Stand Management [S]

S-1:  Identify low-risk areas and emphasize maintaining and/or introducing POC into the species mix.

S-2:  Plant POC singly or in groups at a wide-spacing independent of other stocking.

S-3:  Avoid planting POC within 50 feet of roads, streams, or wet areas.

S-4:  During precommercial thinning [PCT] thin POC at a 25 foot spacing, independent of other crop trees, or space POC in groups 100 feet apart were possible.

S-5:  As part of PCT, remove POC from areas adjacent to roads, streams, and other high-risk areas.

S-6:  To insure the presence of POC through the rotation, leave all thrift cedar during commercial thinning.

S-7:  Manage the cedar component of the stand on a longer rotation than the other associated conifers. Example:  carry cedar through two or three fir rotations.

S-8:  Plant container grown POC until bare root stock can be certified disease free at the nursery.

S-9:  Indicate in stand records (TRI, etc.) that POC protection measures have been implemented.

S-10: Minimize management entries during wet meadow. Wash vehicles when such entries are made. Must be associated with formal road closure.

S-11: Where possible coordinate prevention/control activities with adjacent private landowners.

Other [O]

O-1: Administrative closure orders.

O-2: Coordinate other products utilizations with POC control needs and road closures. Examples: fuelwood cutting, cedar bough cutting.

POC Cumulative Effects Analysis

**[Page K-7]** Each project analysis will contain a discussion of potential cumulative effects. The assessment will use the following definitions and will use the analysis chart to help determine whether there are potential secondary or cumulative effects.

*Definitions*

*Meaningful quantities of POC:* Use 5 percent or greater cover. Consider and identify exceptional situations where less than 5 percent can be meaningful, such as small isolated stands near the edge of the species range.

*Downslope/downstream:* Consider all the forest land areas between the analysis area and the first occurrence of the root disease. If a proposed activity occurs on a ridgetop then analyze both drainages.

*Introducing risk:* Estimate the percent of the analysis area in which the risk of infection is increased as a result of the proposed management activity.

*Meaningful levels of mortality:* This is defined as a mortality rate of 25 percent of existing POC over the next 20 year period.

| Cumulative Effects Analysis Chart | |
|---|---|
| Meaningful quantities of POC within or downslope/downstream of the analysis area? | *If no, then no secondary or cumulative effect.* |
| *If yes, continue.* | |
| Will the proposed project introduce risk to this cedar? | *If no, then no secondary or cumulative effect.* |
| *If yes, continue.* | |
| Following mitigation, is disease likely to infect a major amount of the analysis area?[1] [Ref: 40 CFR 1508.27] | *If no, then no secondary or cumulative effect.* |
| *If yes, then there are potential secondary and cumulative effects.* | |

[1] Major is a relative term; it means great or large in relative importance to POC existence in the near proximity and over its range, notable or conspicuous in effect or scope (for instance, visually detracting), or poses a serious risk to the ecosystem, its neighbor POC, and the total population.

# Existing Direction — Klamath National Forest

The following is from the "Klamath National Forest Land and Resource Management Plan" (1995).

Desired Future Condition of the Forest

The Forest in 10 Years

**[Page 4-16]** Management activities would be promoted than increase the populations of desirable plant species with limited distributions or low population levels.  Species of concern include Brewer spruce, POC, Pacific yew, and sugar pine.

Standards and Guidelines

*Biological Diversity*

**[Page 4-23]** 6-13:  Management activities should be designed to maintain or increase population levels of desirable native plant species that currently have low population levels, of desirable plant species with limited habitat distribution and of desirable plant species that have problems with disease.  Examples include POC, sugar pine, Pacific yew, Brewer spruce, etc.

**[Page 4-24]** 6-15:  All vegetative management practices should be designed to maintain a healthy forest. Conditions that promote the introduction and spread of disease, increase the risk of insect attack or promote unacceptable fire risk should be avoided.

*Transportation and Facilities Management*

**[Page 4-51]** 20-1:  Transportation Planning analysis should:  (4) Evaluate the risk of spread of POC root disease through road upgrades, seasonal closures, permanent closures, maintenance and decommissioning or obliteration.

*Timber Management*

**[Page 4-59]** 21-57:  Maintain a healthy and resilient population of all species, including special interest species such as Pacific yew, brewer spruce, POC, Pacific silver fir, Baker cypress, and whitebark pine throughout their native range.

1.  Projects with the potential to impact special interest species should be analyzed and the potential impacts documented through the EA process.

2.  Mitigation for impacts should include provisions for planting or increasing local populations where desirable.

**[Page 4-60]** 21-61:  Take measures that shall limit the spread of POC root rot, and increase populations of POC on the Forest.  Prevent or reduce the risk of introducing the disease into uninfested areas. Strategies for reducing the risk to POC from infection by the root disease will be integrated into all levels of planning (NEPA documents, ecosystem analysis, LSR assessments, WSR management plans, transportation plans, recreation and other activities or strategies).

In order to reduce the spread of POC root disease, a risk analysis will be completed for all projects in watersheds containing POC.  Disease control strategies identified from experience and research will be applied on a site or drainage-specific basis to reduce the spread and severity of the disease.

## Existing Direction — Shasta-Trinity National Forest

The following is from the "Shasta-Trinity National Forests Land and Resource Management Plan" (1995).

CHAPTER 4, STANDARDS AND GUIDELINES

**[Page 4-18]** 10. Forest Pests

a. When conducting watershed/ecosystem analysis, consider the possible effects that Forest pests may have on management objectives and desired future conditions.

b. Implement an integrated pest management (IPM) program to maintain or reduce forest pest impacts to acceptable levels and to maintain or enhance forest health and vigor. Any decision to use pesticides will require site specific environmental analysis.

e. Take measures that limit the spread of POC root disease.

SUPPLEMENTAL MANAGEMENT AREA (MA) DIRECTION

**[Page 4-102]** MA 5 - Parks-Eddy: (16) Perform a POC risk analysis for any planned management activities in areas with that species. Implement appropriate mitigation measures to prevent the introduction of *Phytophthora lateralis* the cause of POC root disease.

**[Page 4-105]** MA 6 - Upper Trinity: (4) Perform a POC risk analysis for any planned management activities in areas with that species. Implement appropriate mitigation measures to prevent the introduction of *Phytophthora lateralis* the cause of POC root disease.

**[Page 4-109]** MA 7 - Weaverville/Lewiston: (3) Perform a POC risk analysis for any planned management activities in areas with that species. Implement appropriate mitigation measures to prevent the introduction of *Phytophthora lateralis* the cause of POC root disease.

**[Page 4-115]** MA 8 - Trinity Unit: (5) Perform a POC risk analysis for any planned management activities in areas with that species. Implement appropriate mitigation measures to prevent the introduction of *Phytophthora lateralis* the cause of POC root disease.

**[Page 5-9]** TABLE 5-1: MONITORING ACTION PLAN

Forest Pests

Activity, Practice or Effect: Forest pest activity levels (especially where they conflict with management objectives)

Techniques and/or Data Sources: Review project level plans for inclusion of possible pest effects

Intensity and Standard: Regional standards; selected project plans

Frequency of Measurement/Reporting: Annually, as changes occur

Expected Precision/Reliability: High

Variability in Standard Which Would Require Further Evaluation and/or Corrective Action: > 10 percent of project plans fail to consider pests

APPENDIX L, DESCRIPTION OF MANAGEMENT PRACTICES

**[Page L-3]** Integrated Pest Management

The decision-making process considers the ecology of the host and its pests throughout the rotation of the forests. It also considers management objectives and economic values of the resource, couples with monitoring data on pest populations and environmental factors that favor their increase. These data are required to decide for or against action to reduce excessive losses to the resource.

Action alternatives may be oriented toward prevention of losses or they may be in directs response to chronic or catastrophic losses. One or more approaches may be used. These approaches emphasize retention of natural system and include cultural, mechanical, biological, regulatory, and chemical tactics. A no-action alternative may also be appropriate.

## Existing Direction — Siuslaw National Forest

The following is from the "Siuslaw National Forest Land and Resource Management Plan" (1990).

FOREST-WIDE STANDARDS AND GUIDELINES

**[Page IV-58]** FW-179: Pest Management - Use an Integrated Pest Management (IPM) approach, which recognizes pest management as an integral part of timber and other resource management, to prevent and reduce unacceptable pest-related damage. Under IPM, consider and analyze a full range of pest management alternatives, including cultural, biological, chemical, and mechanical methods, on a site-specific, project-level basis. Select specific treatment methods through an environmental analysis process which will consider environmental effects, treatment efficacy, and cost of each alternative on a case-by-case basis. Set up monitoring and enforcement plans to implement specific measures during this site- and project-specific analysis.

OREGON DUNES NATIONAL RECREATION AREA (NRA) MANAGEMENT PLAN, *Amendment to the Siuslaw Forest Plan (1994).*

Management of Habitats

**[Page III-10]** Plants – Management of plant habitats will be focused on globally significant communities included in Management Area [MA] 10(F), plants that are listed as sensitive, and native plant communities associated with the active-dune ecosystem. Management in globally significant communities will focus primarily on maintenance and protection and development of plant-based learning opportunities. Globally significant communities currently within MA 10(F) include:

Port Orford cedar/evergreen huckleberry community.

**[Page III-42]** Management Area 10(F) – Plant, Fish and Wildlife Habitats

Goals – To maintain, create, enhance or restore a variety of special plant, fish and wildlife habitats.

Desired Condition – Optimum physical and biological conditions necessary for target plant, fish or wildlife communities are present. Diverse habitats of various sizes are dispersed across the Oregon Dunes NRA. Even though management activities have taken place, the area is predominantly natural appearing. Human use and disturbance is low. There is an absence of ORVs (other than for administrative uses) and incompatible behaviors such as disturbing animals or harvesting plants. There are few trails or other facilities.

Following are descriptions of the desired condition for the specific components of this management area:

Forest Habitats – Forest stands have multiple vegetation layers except in communities where this would not naturally occur. Where present, the shrub layer is relatively undisturbed. Different plant communities and tree age groups are spread throughout the management area. Snags and down logs are present in numbers expected to occur naturally. There is an abundance of mushrooms and other decomposers.

# Appendix 4: Clorox Use, Toxicity, Potential Environmental Effects, and Label Information

## Introduction and Use

Ultra Clorox® Brand Regular Bleach (EPA Reg. No. 5813-50) is registered for POC root disease treatment use. The active ingredient in Ultra Clorox® is sodium hypochlorite. When used as directed, it is effective in killing PL in treated water. As described in other sections of this SEIS and suggested in the Standards and Guidelines of some of the alternatives, treating water prior to use helps control the spread of PL to uninfested areas. Water is commonly drafted from streams and fire ponds within forested areas to use in dust abatement on forest roads, equipment cleaning, and for fire suppression.

Label instructions (reproduced in this appendix) specify 1 gallon of Ultra Clorox to 1,000 gallons (~50 parts per million available chlorine) of drafted water. Prepare the mixture at least 5 minutes prior to application for dust abatement, fire suppression, and cleaning trucks, logging, road-building, and maintenance equipment.

This label has been in effect since March 5, 2001. The Biscuit Fire on the Siskiyou NF in 2002 burned 500,000 acres including 95,000 acres of POC. Suppression activities lasted over 4 months and restoration activities followed. Approximately 26,700 gallons of Ultra Clorox were used in accordance with the label to treat water used for fire suppression, dust abatement, to clean suppression equipment, and fire area rehabilitation. Although 2002 was an unusually severe fire year in the range of POC, such uses would be projected to continue to a lesser degree under the current direction.

Vehicle and other washing stations are always located where direct runoff will not enter streams. Water spread on roads or dropped onto fires develops into a fine to moderate spray in the air, and spreads on contact. Sodium hypochlorite is a strong oxidizing agent and quickly breaks down into water and chloride ions on contact with organic matter. Decomposition takes place within seconds in the presence of ammonium salts (National Fire Protection Association 1986).

## Toxicity and Potential Environmental Effects

In 1986, based upon available data on Clorox's chemistry, toxicity, environmental fate, and ecological effects, the U.S. Environmental Protection Agency (EPA) concluded that any hazards associated its uses were relatively small (Chemical Fact Sheet 1986). Toxicity characteristics of Clorox were identified as follows:

| | |
|---|---|
| Mallard duck | 5,220 parts per million |
| Quail | 5,620 parts per million |
| Rainbow trout | 0.18 – 0.22 milligrams/liter |
| Daphnia | 0.033 – 0.048 milligrams/liter |

In 1991, the EPA determined that human risks from chronic and subchronic exposure to low levels of Clorox were minimal and without consequence to human health. Upon reevaluating the 1986 data, they also reaffirmed that currently registered uses of Clorox would not result in unreasonable adverse effects to the environment. The EPA also stated they believed that the risk of acute exposure to aquatic organisms was sufficiently mitigated by, in part, its precautionary labeling (EPA 1991).

Sodium hypochlorite is highly toxic to aquatic organisms. The freshwater criteria for the protection of most aquatic species and their uses are 11 micro g/L TRC [total residual chlorine] as a 4-day average (0.011 parts per million) and 19 micro g/L as a 1-hour average (EPA 1984).

Toxicity values for several species of fish are as follow (EPA 1984):

| | Species mean acute values (micrograms/liter) |
|---|---|
| Coho | 74.79 |
| Rainbow Trout | 61.92 |
| Cutthroat Trout | 85.46 |
| Brook Trout | 117.4 |

Research into the control of zebra mussels (*Dreissena polymorpha*) showed it was an effective biocide at concentrations of 1 mg/L (1 parts per million) (Martin et al. 1993). Rainbow trout (*Salmo gairdneri*) exposed to a 30-minute dose showed an LC50 value of 0.43 mg/L at 20 C (0.43 parts per million) while triple exposures for 5 minutes resulted in a LC50 of 1.65 mg/L (Brooks and Seegert 1977).

As previously mentioned, 26,700 gallons of Ultra Clorox were used during the 2002 Biscuit Fire for fire suppression, dust abatement, to clean suppression equipment, and fire area rehabilitation. There were three fish kills thought to be attributable to Clorox bleach-treated water entering streams: all related to operations at fill sites. Two were the result of releases into impoundments behind blocked culverts in very small streams and resulted in mortality within the impoundment, but not downstream. The third release was the result of a water tender breaking down and releasing up to 3,500 gallons of treated water (3.5 gallons of Clorox bleach) into a medium-sized stream. A review of the site by FS and Oregon Department of Fish and Game biologists found 34 dead fish within 80 yards of the discharge site. Live fish were observed 180 yards downstream of the discharge site. Adding Clorox bleach after tanks have been filled and moved away from the fill site would likely avoid similar events in the future.

Non-human mammalian toxicity values are LD50 Rat oral 8.91 g/kg (Department of Transportation-U.S. Coast Guard 1984) and LD50 Mouse oral 5,800 mg/kg (Lewis 1996). There is inadequate evidence for the carcinogenicity of hypochlorite salts (IARC 1991).

### *Alternatives 1, 2, and 3*

Use will continue at approximately existing rates, although 2002 was an unusually heavy fire year in the range of POC. Average annual fire use should be no more than 1,000 to 5,000 gallons, with other uses less than that.

Use of Ultra Clorox® for water decontamination will not result in aquatic exposure if it is applied in accordance with label instructions. When used in water dropped from helicopters, dropping directly into visible water sources is avoided. Drops into smaller wet areas may happen, but water drops are generally only made directly on actively burning spots, so localized effects of dropping treated water is expected to be outweighed by the benefits of reducing the fire intensity. Water errantly dropped on somewhat larger streams may take yards or tens of yards to dilute to sub-toxicity levels, but again these drops occur in areas in the process of being burned.

Ultra Clorox® can cause severe but temporary eye irritation and can be a skin irritant (U.S. Coast Guard, Department of Transportation 1984). Use of the appropriate personnal protective equipment by those preparing the Ultra Clorox® treated water will avoid accidental exposure from splash to eyes or skin.

### *Alternatives 4 and 5*

There are no POC management measures applied under these alternatives that would use Clorox.

## Clorox Label Information

The following information copied verbatim from the Clorox label is pertinent to Port-Orford-cedar root disease control.

ULTRA CLOROX ® BRAND REGULAR BLEACH (EPA Reg. No. 5813-50)
FOR PORT ORFORD CEDAR ROOT DISEASE (*Phytophthora lateralis*) TREATMENT USE

When used as directed, this product is effective in controlling the spread of the fatal fungus *Phytophthora lateralis* [Port Orford Cedar Root Disease] in areas of California and Oregon where Port Orford Cedar (*Chamaecyparis lawsoniana*) grows.

Water is commonly drafted from streams and fire ponds within forested areas to use in dust abatement on forest roads, equipment cleaning, a nd for fire suppression. The water source can spread the root disease fungus to uninfested areas. Treating water prior to use helps control the spread of the fungus.

**Directions for Use**: Add 1 gallon this product to 1000 gallons (~50 parts per million available chlorine) of drafted water. Prepare the mixture at least 5 minutes prior to application for dust abatement; fire suppression; and cleaning trucks, and logging, road building, and maintenance equipment.

DILUTION TABLE

| Approximate available Chlorine | Volume of Bleach | Volume of Water |
|---|---|---|
| 50 | 16 drops | 1 quart |
| | ¾ tsp. | 1 gallon |
| | 1 Tbsp. (1/2 oz) | 4 ½ gallons |
| | 2 ½ Tbsp. | 10 gallons |

PRECAUTIONARY STATEMENTS: HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: CORROSIVE
May cause severe irritation or damage to eyes and skin. Harmful if swallowed. Protect eyes when handling. For prolonged use, wear gloves. Wash after contact with product. Avoid breathing vapors and use only in a well-ventilated area.

**FIRST AID IF IN EYES**: Rinse with plenty of water for 15 minutes. Get prompt medical attention. **IF SWALLOWED**: Drink large amounts of water. DO NOT induce vomiting. Call a physician or poison control center immediately. **IF IN CONTACT WITH SKIN**: wash skin thoroughly with water.

**PHYSICAL OR CHEMICAL HAZARDS**: Product contains a strong oxidizer. Always flush drains before and after use. **Do not use or mix with other household chemicals**, such as toilet bowl cleaners, rust removers, acids, or products containing ammonia. To do so will release hazardous irritating gases. Prolonged contact with metal may cause pitting or discoloration.

***For Institutional use only:***
**ENVIRONMENTAL HAZARDS:** Do not discharge effluent containing this product into lakes, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge System (NPDES) permit and the permitting authority has been notified in writing prior to discharge.

**STORAGE AND DISPOSAL:** Store this product upright in a cool, dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Small quantities of spilled or unusable product should be diluted with water before disposal in a sanitary sewer. Do not reuse empty container, but rinse and place in trash or recycle where facilities accept colored HDPE bottles. Do not contaminate water, food, or feed by storage, disposal or use of this product. **Store away from children. Reclose cap tightly after each use.** Offer empty container for recycling. If recycling is not available, discard container in trash. DO NOT allow product [and/or rinsate] to enter storm drains, lakes, streams, or other bodies of water.

**CLOROX CUSTOMER ASSISTANCE (800) 292-2200**

# Appendix 5: Monitoring Plans for Each Alternative

## Alternative 1

Alternative 1 is covered by existing land and resource management plan monitoring plans.

## Alternatives 2–6

To maintain POC as an ecologically and economically significant species on BLM- and FS-administered lands, management strategies (both actions and inactions) will be evaluated.

### Implementation Monitoring — *Questions*

1) Have resistance breeding and genetic conservation requirements been met?

2) Are general requirements for maintaining and reducing the risk of PL infections being implemented? *Note:* For Alternative 2, these are listed under General Direction (which is incorporated into Alternatives 3 and 6).

3) Are project-specific management actions applied as required?

### Implementation Monitoring — *Requirements*

1) The Agencies will address current accomplishments including levels of established conservation seedbanks in annual updates for the resistance breeding program.

2) The Coos Bay, Medford, and Roseburg BLM Districts will report in their annual program summaries, and the Siskiyou NF in its annual monitoring and evaluation report, the general activities accomplished for maintaining and reducing the risk of PL infections.

3) Administrative units will incorporate POC management actions into their existing project-specific implementation monitoring programs.

### Effectiveness and Validation Monitoring — *Questions*

1) Is the genetic resistance program producing POC seedlings that survive long term under field conditions?

2) Are disease-controlling mitigation measures such as road use restrictions and closures, sanitation, and washing, effective as predicted, and is the risk associated with projects such as fire suppression at presumed or predicted levels?

3) Has the spread or non-spread of the disease significantly departed from the predictions made in this SEIS that were used to select a management strategy?

4) [Under Alternatives 3 and 6 only] Is the disease being kept out of the uninfested

watersheds and if not, have appropriate eradication treatments been tried and are they successful?

## Effectiveness and Validation Monitoring — *Requirements*

1) The "Dorena Port-Orford-Cedar Interagency Agreement" will report annually survival results of validation studies that determine effectiveness of the genetic resistance program.

2) The USDA-FS Southwest Oregon Forest Insect and Disease Service Center will continue to evaluate and coordinate existing management techniques to reduce the occurrence of PL and retain healthy POC. Emphasis will be directed towards ongoing projects and monitoring their results. Actual monitoring will be split between the Service Center and the administrative units where management occurs. Additional (new) monitoring efforts will be a function of available budget and workforce. An example is whether prescribed fire heats the soil enough to be effective as an eradication treatment. In some cases, university research will be the appropriate vehicle to accomplish evaluations of management techniques.

3) As new inventory data (continuous vegetation survey and forest inventory and analysis) and local mapping becomes available, it will be evaluated for current levels (acres and/or number of trees) of infected and uninfected POC and corresponding trends. Inventory plots are typically reinventoried on a 3- to 10-year cycle, depending upon location.

4) [Alternatives 3 and 6 only] Road, aerial, or photo surveys of the uninfested watersheds will be done to identify new infestations at least once every 2 years.

# Appendix 6: Resistant Port-Orford-Cedar Planting and Growth Assumptions

This appendix describes assumptions about the planting and growth of resistant stock under the various alternatives. This information is used, where identified, in the long-term projection of various secondary environmental effects described in Chapter 3&4.

## Resistant Seed Availability

The year resistant seed is expected to become available for each seed zone is shown in the Genetics section on the Table 3&4-21. In general, resistant seed will become available for all seed zones in Oregon by the year 2010 under the accelerated program (Alternative 4), and under Alternatives 1, 2, 3, and 6 will become available in at least one elevation zone in each breeding block in Oregon by 2020, available for 99 percent of POC Federal acres in Oregon by 2030, and available for all areas in Oregon by 2045. Until resistant seed is developed for each breeding zone, it will be possible to utilize seed from adjacent breeding zones (especially from similar plant associations) to meet any immediate needs, as well as using local, nonresistant seed. In Alternative 5, resistant seed will be available for the approximately 201,000 acres in Oregon for which seed orchards are already developed.

Because resistant seed orchard trees can bear cones annually and prolifically if stimulated, seed could be available to meet any projected need-level, including reforestation following a large fire event, although seed collection, sowing, and growth to reach a plantable seedling size generally takes 2 to 3 years after an expected need for seedlings is identified. The potential availability of surplus Federal POC seed or seedlings for use by state and private landowners should also be considered.

## Resistance Levels and Durability

As described in the Genetics section of Chapter 3&4, long-term (durable) resistance in a significant portion (more than half) of resistant seedlings is likely based on short-term greenhouse tests. Evidence for this conclusion includes nearly 100 percent survival of resistant seedlings after the first 2 years, the very narrow genetic variability of PL itself (having presumably come from a single introduction), and the very limited ability of PL to spread bisexually-developed spores. Allowing for mortality immediately after planting and some additional mortality during the life of the POC stand is not dissimilar to the way other species plantation are considered. Planting will provide double or more of the seedlings desired, and future thinning (to increase growth on remaining trees) will remove trees through the early life of the stand if random PL and other mortality does not remove them. In other words, if 20 to 30 large trees per acre are desired at age 100, planting 120 trees per acre and subsequent stand tending can be expected to produce that result even if 50 to 75 percent of planted trees are lost to PL.

## Where Seedlings Should be Planted

A variety of ecological benefits and economic gains can be made by planting resistant seedlings, when available, outside of PL-mortality areas. POC will be included in planting suitable new sites within its natural range (as shown on Map 4) not previously occupied by

POC (both on public and private lands), and low-risk sites (especially upslope from infested sites so resistant genes can contribute to restocking). High-risk sites in the interior of the range of POC should especially be considered for with planting resistant stock. It is assumed resistant seedlings will be planted in all three of these cases, and become a part of the species mix when planting on potential POC sites.

POC may also be planted in infested areas to replace POC lost to PL or other causes, where an examination determines the value of replacing the killed POC outweighs the risk of maintaining PL on the site. In general, infested areas can be planted that are away from areas frequented by people and other PL-spread mechanisms. Planting should focus on replacing POC where its ecological function is most critical, such as along streams on ultramafic soils, and to replace stands lost to wildfire. If PL is eradicated from a given site, then POC, both resistant and nonresistant seedlings, should be considered for planting. It is assumed most nonwilderness wildfire-killed stands will be planted unless natural regeneration is determined likely to meet stocking objectives. It is also assumed planted resistant trees will eventually mitigate 50 percent of significant environmental loss resulting from PL mortality. For example, assume planting (or other ingrowth) will eventually replace at least 50 percent of shade loss along streams where PL-related mortality is causing temperature increases that threaten listed species.

If persistent POC are desired to contribute to pollen and seed shed for subsequent natural regeneration, and/or to reach large sizes for ecological and economic considerations within 50 to 100 years, specific regeneration cuts, site preparation, as well as continued tending may be needed. Three geographical areas within the natural range of POC illustrate different circumstances:

a. **Coastal Stands.** Where POC tends to occur across the landscape, without distinct distributional limits. In this environment, normal regeneration harvest techniques have shown to allow reestablishment of POC when outside the influence of PL. When established with other conifers, stand tending to favor POC will probably be needed to maintain its crown position.

b. **Serpentine.** Stands in these localities are often characterized by open-grown, widely-scattered overstory trees. Planting resistant POC will be relatively free to grow and, except for some brushy patches, may not need significant stand tending.

c. **Interior, Non-Serpentine.** Where POC is concentrated near streams, riparian competition from Douglas-fir, hemlock, pines, and hardwoods often restrict POC regeneration and growth without special regeneration or release cuts. In this portion of the POC's range, however, it is believed that it will survive and thrive when planted on upslope topographies, both where it grows naturally and beyond its natural occurrence. If POC is desired to be large in less than 100 years, regeneration cuts, such as shelterwood treatments, may be needed to allow it to grow. Precommercial and commercial thinning may also be necessary to maintain POC in the overstory. If maintained in stands in a dominant-codominant crown position, planted resistant POC should begin to contribute to pollen and seed shed in 25 to 30 years.

## Where Seedlings Should Not be Planted

There is a risk that planting resistant seedlings on PL-infested sites will help maintain PL on those sites, even if all naturally occurring POC on the site have died. It is unclear whether resistant stock will support PL. Additionally, seedlings from planted stock, or POC seeding in from surrounding stands that are indistinguishable from planted stock, could carry PL. For these reasons, the planting of resistant stock should be avoided where there is reason to avoid the maintenance of PL on the site. Locations where seedlings should not be planted include (1) areas where eradication treatments are actively underway and PL has not died out from the site; (2) unstocked areas between infested and uninfested stands; and (3) in roadside and other sanitation areas, and in areas where foot, vehicle, or animal traffic is likely to move infested mud to other locations, such as along roads and trails, in campgrounds, at trailheads and boat launches, and along major game or stock trails connecting infested and uninfested areas or watersheds.

## Acres to be Planted

For the purposes of this SEIS and for all alternatives except Alternative 5, assume the overall annual planting rate for POC will be at least 25 percent of the average annual mortality rate predicted outside of the North Coast Risk Region (see 100-year infestation prediction for Oregon by alternative in the Pathology section of Chapter 3&4), beginning when seedlings become available for each breeding zone. For example, in Alternative 4, 100-year mortality outside the North Coast Risk Region is predicted to be 41,700 plus 14,600, or 56,300 acres (from Table 3&4-10). Although actual mortality may be sporadic for a variety of reasons, the average is 563, and 25 percent is 140 acres per year. First priority for this planting is to replace ecologically significant POC lost to PL or other causes. Increases in fire-mortality or post-harvest planting could substantially increase these rates.

It is assumed plantations of resistant POC will be tracked in agency plantation records and made high priority for stand-tending treatments such as protection from browsing, release, and thinning, as needed to meet site growth objectives.

Assumptions of projected mortality are difficult to make because so much POC mortality is scattered in small pockets where the effect of POC loss will be at least partially negated by natural POC regeneration or growth of other species, or where it is not otherwise cost-efficient to mobilize planting and stand tending crews to replace them.

## Predicted Growth Rates

POC is capable of moderately rapid growth, but it slows greatly if overtopped by other species. In natural stands following fire, POC grew quickly for 20 to 25 years until over-topped by Douglas-fir and other species (Hayes 1958). In relatively pure, natural stands near Coos Bay, the mean height of POC was 51 feet and 73 feet at ages 36 and 44 years. Plantation POC was as tall as 32 feet and 40 feet at 14 and 19 years (Hayes 1958).

Examination of the diameter-to-age ratios for all POC trees identified on CVS plots on Federal lands in Oregon shows a diameter at breast height range of 6 to 40 inches at 100 years, with 10 percent exceeding 24 inches, and no discernable difference between those on ultramafic soils (as indicated by the presence of Jeffrey pine on the same plot) and those on nonultramafic sites. Since natural POC often spend 2 to 300 years overtopped, releasing only after surrounding Douglas-fir or other species die, growth with stand tending can be expected to match this 90$^{th}$ percentile. A diameter-to-age relationship compiled by Atzet (1996) for POC found on ecology inventory plots in southwest Oregon showed that unmanaged POC averaged 24 inches diameter at breast height at 120 years, with the 90$^{th}$ percentile at 100 years being over 30 inches diameter at breast height.

For planted resistant seedlings, it is reasonable to expect the size of at least the largest 8 to 12 tended POC per acre to exceed 100 feet in height and 24 inches in diameter at 100 years unless overtopped by other species. In such a case, however, at least part of the ecological function (such as streamside shade for fisheries) expected from large POC would generally be met by the overtopping tree species

## Monitoring

It is assumed that field validation plantings and other host/pathogen studies will be continued at the appropriate levels for each respective alternative and adjustments, if needed, in both the POC breeding program and eventual deployment of resulting seed will be done.

# Appendix 7: Biological Evaluations

## Wildlife

### Threatened and Endangered Species

Implementation of any of these alternatives would result in a *may affect*, *likely to adversely affect* on the northern spotted owl and marbled murrelet and a *may affect* on the critical habitats of the northern spotted owl and marbled murrelet.

#### Northern Spotted Owl (*Strix occidentalis caurina*) and its Critical Habitat

Management of the northern spotted owl and its habitat on federally-managed lands was an important consideration in the design of the Northwest Forest Plan. This species received extensive attention in the Northwest Forest Plan final SEIS and its supporting documents. Project-specific analysis/consultation will be conducted to mitigate site-specific impacts, where capable, and meet the intents of NEPA, the "Endangered Species Act," and planning regulations.

**Environmental Consequences**

**Alternatives 1 and 2.** Under the current strategy for managing POC and PL, very few activities affect the northern spotted owl. Habitat modifications and loss of POC in mid- and late-seral stages during roadside sanitation efforts may occur. There are approximately 9 acres of potential treatment area per 1 mile of road, although this is not all habitat. Much of the roadside sanitation area is within the original clearing limits of the road. The loss of the larger diameter POC would reduce the value of the habitat for species dependent upon large trees, depending on the proportion of such trees in the stand that are POC. Due to the spacing of very large trees it is unlikely that a substantial number of large-diameter trees would be removed by road sanitation in any one stand. The precise level of road treatments to occur is unknown, but it is expected to approximate that described in Appendix 2. Although snags are not removed during sanitation treatments, few snags of any species are left adjacent to roads due to safety concerns.

Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting habitat, benefiting northern spotted owls. Disturbances from road use may influence habitat use, nesting behavior and success, and foraging success. Detrimental impacts of road use can extend 65 to 100 yards into the stand (Tuss, C., *personal communication*). Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small. All provisions provided for the northern spotted owl in current resource management plans/land management plans would be implemented.

About 74 percent of the Federal landscape within the analysis area is within reserves other than riparian. The remaining 26 percent is Matrix/Riparian Reserve. The Northwest Forest Plan projected that less than 4 percent of the remaining late-successional forest would be harvested per decade. Actual harvest has been well below that rate. Based on the harvest rate in the last 8 years, late-successional forests have been harvested at less than 2.5 percent for the first decade. The reduced rate of harvest is due primarily to greater than expected

Riparian Reserve coverage, the effects of Survey and Manage mitigation measures, and legal challenges. Harvest of late-successional forests under both alternatives would not exceed the rate anticipated in the Northwest Forest Plan final SEIS.

Implementation of Alternatives 1 and 2 in 100 years would result in infestations covering approximately 17 percent of POC in the North Coast Risk Region, 20 to 23 percent in the Siskiyou Risk Region, and 24 to 29 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss is expected to be most severe in ultramafic plant associations (40 percent of the 90,900 acres where POC is a predominant component of the overstory) where it often constitutes up to 38 to 50 percent of the overstory cover. Loss of large-diameter-overstory trees could include loss of foraging structures, loss of nesting/roosting habitat, and possible disruption of dispersal. Prey species and their susceptibility to predation may be benefited by increases to the woody and herbaceous plant biomass in the lower strata. The direct impacts to the spotted owl should be isolated to individual POC trees and small patches. In the next 100 years, up to approximately 23,000 acres of uninfested POC could become infested (8 percent of the analysis area) (Table 3&4-10).

Prey species may also be negatively affected by loss of future woody biomass, although this effect is low for POC when compared with other tree species. The same wood chemistry characteristics that make POC a valuable commercial species may negatively impact its value to spotted owls and their prey as a snag. POC is highly resistant to rot and insects and may remain intact for decades (Jules et al. 2002). Jules et al. (2002) utilized increment cores from POC snags that indicated those trees died more than 100 years prior. Increment cores must be intact for accurate dating to occur. Research on yellow cedar (*Chamaecyparis nootkatensis*), a similar species, has found that cavity nesting is rare in snags, even 80 years after the trees died (Hennon et al. 2002). POC snags, like yellow cedar, possibly contribute very little to wildlife habitat components (DeMeo, T., *personal communication*; Jimerson, T.M., *personal communication*; Hennon et al. 2002). No work has look specifically at the wildlife contributions of POC snags/logs, but snags probably provide very little benefit to the northern spotted owl. Downed logs should provide hiding cover and travel corridors initially and improve as they progress into more decayed classes which should benefit spotted owl prey species.

In conclusion, Alternatives 1 and 2 could result in the loss of individual nesting structure, either through management to contain the spread of PL or through the natural progression of the infestation. Stands with POC may be degraded, but should continue to provide suitable spotted owl habitat. Where POC deaths result in the reduction of canopy below approximately 70 percent, stands may be downgraded from suitable habitat to dispersal habitat, but this should be the exception. Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or upon reforestation efforts as described in the Planting Assumptions and Appendix 6. The development of PL-resistant stock would help to restore the POC losses. Available for deployment in 0 to 40 years depending upon seed zone (see Table 3&4-21 in the Genetics and Resistance section), larger-diameter POC are expected to be in the landscape again 80 to 100 years later.

**Alternative 3.** This alternative creates a system of POC buffers and cores within 31 6th field watersheds that are currently uninfested with PL (494,000 acres; 32 percent of the Federal lands in the analysis area). Timber harvests would be eliminated on approximately 2,260 acres of Matrix/Adaptive Management Area lands, and additional acres of reserves, in the POC cores; this restriction does not preclude salvage options in the case of a stand-replacing event. Additionally, all POC would be removed along all roads within the POC cores. There are approximately 9 acres of treatment area per mile of road, although not all of this area is necessarily suitable spotted owl habitat. The loss of the larger-diameter trees could have some effect on ability of the stands to function as before. Due to the spacing of very large trees it is unlikely that a substantial number of large-diameter trees would be removed by road sanitation in any one stand. The loss of these trees would not affect the adjacent stands' functionality. Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting habitat and benefit northern spotted owls. Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small. Within POC buffer areas future infestation of PL would be eradicated.

Areas outside of the POC buffers and cores would be managed and the same as Alternative 2.

Implementation of Alternatives 3 in 100 years would result in infestations covering approximately 16 percent of the POC in the North Coast Risk Region, 17 percent in the Siskiyou Risk Region, and 19 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts from POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the spotted owl should be isolated to individual POC trees and small patches. In the next 100 years, approximately 11,400 acres of uninfested POC could become infested (4 percent of the analysis area) (Table 3&4-10).

**Alternatives 4 and 5.** These alternatives allow for the progression of PL across the landscape. There are no active management actions planned that would cause the direct loss or modification of suitable nesting, roosting, foraging, or dispersal habitat. PL resistant stocks of POC would be used to restore POC to the landscape. Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or reforestation efforts described in the Planting Assumption. The development of PL-resistant stock would help to restore the POC losses—Alternative 4 more than Alternative 5. Available for deployment within 10 years in Alternative 4, and just for certain seed zones in Alternative 5 (see Table 3&4-21 in the Genetics and Resistance section), large-diameter POC could be in the landscape again 80 to 100 years later.

Implementation of Alternatives 4 and 5 in 100 years would result in infestations covering approximately 19 percent of in the North Coast Risk Region (compared to 15 percent today), 36 percent in the Siskiyou Risk Region (compared to 11 percent today), and 50 percent in the Inland Siskiyou Risk Region (compared to 9 percent today) to become infected with PL. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the spotted owl should be isolated to individual POC trees and small patches. In the next 100 years, approximately 45,900 acres of uninfested POC could become infested (17 percent of the analysis area) (Table 3&4-10).

**Alternative 6.** The effects of Alternative 6 are the same as Alternative 3 except as follows. Alternative 6 would provide additional protection for 162 7th field watersheds that are currently identified as being uninfested with PL (rather than the 6th field watersheds described in Alternative 3). Timber harvest would be prohibited in watersheds (Table 3&4-

24b) that have POC (POC cores), including 3,010 acres of Matrix and Adaptive Management Area that are currently available for regularly scheduled timber harvest and contribute to probable sale quantity.

Implementation of Alternatives 6 in 100 years would result in root disease infestations covering approximately 16 percent of the total area to contain infested POC in the North Coast Risk Region, 17 percent in the Siskiyou Risk Region, and 18 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be similar to those discussed for alternatives 1 and 2. The direct impacts to the spotted owl should be isolated to individual POC trees and small patches. In the next 100 years, approximately 10,300 acres of uninfested POC could become infested (4 percent of the analysis area) (Table 3&4-10).

## Marbled Murrelet (*Brachyramphus marmorata*) and its Critical Habitat

The management strategy for marbled murrelets in the Northwest Forest Plan includes two primary components: (1) protection and development of marbled murrelet nesting habitat inside the large reserves near the coast; and (2) retention of all current and future known marbled murrelet nest sites in all land allocations and protecting occupied habitat. POC contributes to the overall ability of the surrounding stand to function as marbled murrelet nesting habitat, but serves as an inferior nesting platform because of its limb structure.

**Environmental Consequences:** Under all alternatives, the level of protection for currently occupied marbled murrelet habitat would not be changed; all habitat-disturbing activities would have preproject surveys accomplished and known and future nest sites would be protected. All requirements of the land management plans/resource management plans and the “Endangered Species Act” would be fulfilled prior to implementation of specific projects.

**Alternatives 1 and 2.** Under the current strategy for managing POC and PL, very few activities have effects to murrelet habitat. Habitat modifications and loss of POC in mid- and late-seral stages during roadside sanitation efforts may occur. There are approximately 9 acres of potential treatment area per 1 mile of road, although this is not all habitat. Much of the roadside sanitation area is within the original clearing limits of the road. The loss of the larger-diameter POC would reduce the value of the habitat for murrelets depending on the proportion of such POC trees in the stand. Due to the spacing of very large trees it is unlikely that a substantial number of large-diameter trees would be removed by road sanitation in any one stand. The precise level of road treatments to occur is unknown, but it is expected to approximate that described in Appendix 2. Although snags are not removed during sanitation treatments, few snags of any species are left adjacent to roads due to safety concerns.

Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting habitat, benefiting marbled murrelet. Disturbances from road use may influence habitat use, nesting behavior and success, and foraging success. Detrimental impacts of road use can extend 65 to 100 yards into the stand (Tuss, C., *personal communication*). Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small. All provisions provided for the marbled murrelet in current resource management plans/land management plans would be implemented.

About 74 percent of the Federal landscape within the analysis area is within reserves other than riparian. The remaining 26 percent is Matrix/Riparian Reserve. The Northwest Forest Plan projected that less than 4 percent of the remaining late-successional forest would be harvested per decade. Actual harvest has been well below that rate. Based on the harvest rate in the last 8 years, late-successional forests have been harvested at less than 2.5 percent for the first decade. The reduced rate of harvest is due primarily to greater than expected Riparian Reserve coverage, the effects of Survey and Manage mitigation measures, and legal challenges. Harvest of late-successional forest under both alternatives would not exceed the rate anticipated in the Northwest Forest Plan final SEIS.

Implementation of Alternatives 1 and 2 in 100 years would result in approximately 2 percent of POC not currently infected with PL in the North Coast Risk Region, 9 to 12 percent in the Siskiyou Risk Region, and 15 to 20 percent in the Inland Siskiyou Risk Region to become infected with PL. POC is currently a prominent component of the overstory on 90,900 acres in Oregon. Impacts from POC loss are expected to be most severe in ultramafic plant associations (40 percent of those stands where POC is a predominant component of the overstory) where it often constitutes up to 38 to 50 percent of the overstory cover. Loss of large-diameter-overstory trees could include the modification of conditions affecting the nesting suitability of adjacent trees. The direct impacts to the marbled murrelet should be isolated to individual POC trees and small patches. In the next 100 years, up to approximately 23,000 acres of uninfested POC could become infested (Alternative 1) (8 percent of the analysis area) (Table 3&4-10). Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or upon reforestation efforts as described in the Planting Assumption and Appendix 6. The development of PL-resistant stock would help to restore the POC losses. Available for deployment in 0 to 40 years depending upon seed zone (see Table 3&4-21 in the Genetics and Resistance section), larger-diameter POC are expected to be in the landscape again 80 to 100 years later

**Alternative 3.** This alternative creates a system of POC buffers and cores within 31 6th field watersheds that are currently uninfested with PL (494,000 acres; 32 percent of the Federal lands within the analysis area). Timber harvests would be eliminated on 2,260 acres of Matrix/Adaptive Management Area, and additional acres of reserves, in the POC cores; this restriction does not preclude salvage options in the case of a stand-replacing event. Additionally, all POC would be removed along all roads within the POC cores. There are approximately 9 acres per mile of road. The loss of the larger-diameter trees could have some effect on ability of the stands to function as before. Due to the spacing of very large trees it is unlikely that a substantial number of large-diameter trees would be removed by road sanitation in any one stand. The loss of these trees would not affect the adjacent stands' functionality. Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting habitat, benefitting murrelet. Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small. Within POC buffer areas, future infestation of PL would be eradicated. Areas outside of the POC buffers and cores would be managed the same as Alternative 2.

Implementation of Alternative 3 in 100 years would still result in PL infestations covering approximately 1 percent of POC not currently infected with PL in the North Coast Risk Region, 6 percent in the Siskiyou Risk Region, and 10 percent in the Inland Siskiyou Risk Region. Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the marbled murrelet should be isolated to individual POC trees and small patches. In the next 100 years, approximately 11,400 acres of uninfested POC could become infested (4 percent of the analysis area) (Table 3&4-10).

**Alternatives 4 and 5.** Alternatives 4 and 5 allow for the natural progression of PL across the landscape. There are no active management actions planned that would cause the direct loss or modification of suitable nesting habitat. PL-resistant stocks of POC would be used to restore POC to the landscape. Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or reforestation efforts described in the Planting Assumptions. The development of PL-resistant stock would help to restore the POC losses—Alternative 4 more than Alternative 5. Available for deployment within 10 years in Alternative 4 and only for certain breeding zones in Alternative 5 (see Table 3&4-21 in the Genetics and Resistance section), large-diameter POC could be in the landscape again 80 to 100 years later.

Implementation of Alternatives 4 and 5 would still allow approximately 4 percent of POC not currently infected with PL in the North Coast Risk Region, 25 percent in the Siskiyou Risk Region, and 41 percent in the Inland Risk Region to become infected with PL. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the marbled murrelet should be isolated to individual POC trees and small patches. In the next 100 years, approximately 45,900 acres of uninfested POC could become infested (17 percent of the analysis area) (Table 3&4-10).

**Alternative 6**. The effects of Alternative 6 are the same as Alternative 3 except as follows. Alternative 6 would provide additional protection for 162 7th field watersheds that are currently identified as being uninfested with PL (rather than the 6th field watersheds described in Alternative 3). Timber harvest would be prohibited in the 49,675 acres (Table 3&4-24b) that have POC (POC cores), including approximately 3,010 acres of Matrix and Adaptive Management Area that are currently available for regularly-scheduled timber harvest and contribute to probable sale quantity.

Implementation of Alternatives 6 in 100 years would result in infestations covering approximately 16 percent of POC in the North Coast Risk Region, 17 percent in the Siskiyou Risk Region, and 18 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the marbled murrelet should be isolated to individual POC trees and small patches. In the next 100 years, approximately 10,300 acres of uninfested POC could become infested (4 percent of the analysis area) (Table 3&4-10).

### Bald Eagle (*Halieatus leucocephalus*)

The Agencies survey extensively for bald eagles. Management of the bald eagle includes preparation of site-specific management plans and providing protection zones and management areas, as needed, to the species and its habitat. All requirements of the land management plans/resource management plans and the “Endangered Species Act” would be fulfilled prior to implementation of specific projects.

**Environmental Consequences:**

**Alternatives 1 and 2.** Bald eagles utilize large-diameter snags and snag-topped trees for nesting and roosting along high order streams or within 1 to 2 miles of a high order stream. Under the current strategy for managing POC and PL, very few activities have effects to the bald eagle. Habitat modifications and loss of POC in mid- and late-seral stages during roadside sanitation efforts may occur. There are approximately 9 acres of potential treatment area per 1 mile of road, although this is not all habitat. Much of the roadside sanitation area is within the original clearing limits of the road. The loss of the larger diameter POC would reduce the value of the habitat for bald eagles dependent upon large trees, depending on the proportion of such trees in the stand that are POC. Due to the spacing of very large trees, it is unlikely that a substantial number of large-diameter trees would be removed by road sanitation in any one stand. The precise level of road treatments to occur is unknown, but it is expected to approximate that described in Appendix 2. Although snags are not removed during sanitation treatments, few snags of any species are left adjacent to roads due to safety concerns.

Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting habitat, benefiting bald eagles. Disturbances from road use may influence habitat use, nesting behavior and success, and foraging success. Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small.

Implementation of Alternatives 1 and 2 in 100 years would result in infestations covering approximately 17 percent of POC in the North Coast Risk Region, 20 to 23 percent in the Siskiyou Risk Region, and 24 to 29 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be most severe in ultramafic plant associations (40 percent of those stands where POC is a prominent component of the overstory) where POC often constitutes up to 38 to 50 percent of the overstory cover. The death of large-diameter overstory trees could increase available nesting and roosting structure. The direct impacts to the bald eagles should be isolated to the loss of potential nesting and roosting structure due to infestation control treatments. Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or upon reforestation efforts as described in the Planting Assumptions and Appendix 6. The development of PL-resistant stock would help to restore the POC losses. Available for deployment in 0 to 40 years depending upon seed zone (see Table 3&4-21 in the Genetics and Resistance section), larger-diameter POC are expected to be in the landscape again 80 to 100 years later

**Alternative 3.** This alternative creates a system of POC buffers and cores within 31 6th field watersheds that are currently uninfested with PL (494,000 acres; 32 percent of the Federal lands within the analysis area). Timber harvests would be eliminated on approximately 2,260 acres of Matrix/Adaptive Management Area, and additional reserve acres, in the POC cores; this restriction does not preclude salvage options in the case of a stand-replacing event. Additionally, all POC would be removed along all roads within the POC cores. There are approximately 9 acres of treatment area per 1 mile of road, although not all of the treatment area would provide suitable eagle habitat. The loss of the larger-diameter trees could have some effect on ability of the stands to function as before. Due to the spacing of very large trees it is unlikely that a substantial number of large-diameter trees would be removed due to road sanitation in any one stand. The loss of these trees would not affect the adjacent stands' functionality. Road closures and seasonal use restrictions would reduce disturbance associated with road use and adjacent nesting, benefitting bald eagles. Many of the roads to be closed or seasonally restricted are low-use roads, so benefits may be relatively small. Within POC buffer areas future infestation of PL would be eradicated. Areas outside of the POC buffers and cores would be managed the same as Alternative 2.

Implementation of Alternative 3 in 100 years would still result in approximately 16 percent of POC in the North Coast Risk Region, 17 percent in the Siskiyou Risk Region, and 19 percent in the Inland Siskiyou Risk Region being infested with PL (from 15, 11, and 9 percent, respectively, today). Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the spotted owl should be isolated to individual POC trees and small patches. In the next 100 years approximately 11,400 acres of uninfested POC could become infested ( 4 percent of the analysis area) (Table 3&4-10).

**Alternatives 4 and 5.** Alternatives 4 and 5 allow for the natural progression of PL across the landscape. There are no active management actions planned that would cause the direct loss or modification of suitable nesting habitat. PL resistant stocks of POC would be used to restore POC to the landscape. Ecosystem recovery, primarily the recovery of the overstory canopy, will be highly dependent upon the ability of the stand to revegetate naturally or reforestation efforts described in the Planting Assumptions. The development of PL-resistant stock would help to restore the POC losses—Alternative 4 more than Alternative 5. Available for deployment within 10 years in Alternative 4, and only in certain breeding zones in Alternative 5 (see Table 3&4-21 in the Genetics and Resistance section), large-diameter POC could be in the landscape again 80 to 100 years later.

Implementation of Alternatives 4 and 5 would result in approximately 19 percent of POC in the North Coast Risk Region, 34 percent in the Siskiyou Risk Region, and 50 percent in the Inland Risk Region to become infected with PL (from 15, 11, and 9 percent today). POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts from POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the bald eagle should be isolated to individual POC trees and small patches. In the next 100 years, approximately 45,900 acres of uninfested POC could become infested (17 percent of the analysis area) (Table 3&4-10).

**Alternative 6**. The effects of Alternative 6 are the same as Alternative 3 except as follows. Alternative 6 would provide additional protection for 162 7th field watersheds that are currently identified as being uninfested with PL (rather than the 6th field watersheds described in Alternative 3). Timber harvest would be prohibited in the 49,675 acres (Table 3&4-24b) that have POC (POC cores), including approximately 3,010 acres of Matrix and Adaptive Management Area that are currently available for regularly scheduled timber harvest and contribute to probable sale quantity.

Implementation of Alternatives 6 in 100 years would result in infestations covering approximately 16 percent of the POC in the North Coast Risk Region, 17 percent in the Siskiyou Risk Region, and 18 percent in the Inland Siskiyou Risk Region. POC is currently a prominent component in 90,900 acres of forestland in Oregon. Impacts to POC loss are expected to be similar to those discussed for Alternatives 1 and 2. The direct impacts to the eagle should be isolated to individual POC trees and small patches. In the next 100 years, approximately 10,300 acres of uninfested POC could become infested (4 percent of the analysis area) (Table 3&4-10).

## <u>Vernal pool fairy shrimp (Branchinecta lynchi) and its Critical Habitat</u>

This species does not require POC or forested habitats for critical components of its life history.

These alternatives will have no effect upon the habitat components of this species. Therefore, these alternatives have no affect to the vernal pool fairy shrimp.

## <u>Special Status Species</u>

### *BLM Special Status Species*

The BLM special status species policy is applied to actions requiring authorization or approval by the Bureau to insure they are consistent with conservation needs of these species and do not contribute to the need to list them under the provisions of the "Endangered Species Act."

BLM special status species are as follows: Federal endangered, threatened, proposed and candidate species; State endangered and threatened species; Bureau sensitive; Bureau assessment; and Bureau tracking. Those special status species occurring within the analysis area are listed in Table A7-1. None of the special status species listed in Table A7-1 are known to depend upon POC for habitat. Known sites for these species will continue to be managed as necessary to preclude the need to list them under the "Endangered Species Act" for all alternatives.

For Bureau sensitive or Bureau assessment species, the BLM requires review and assessment of potential effects, both beneficial and adverse, upon habitat considerations of each respective species. One or more of the following techniques may be used (BLM Instruction Memorandum No. OR-2003-054):

- Evaluation of species-habitat and presence of suitable or potential habitat;
- application of conservation strategies, plans, and other formalized conservation mechanisms;
- review of existing survey records, inventories, and spatial data;
- utilization of professional research, literature, and other technology transfer sources;
- use of expertise, both internal and external, that is based on documented, substantiated professional rationale; and/or
- complete pre-projects survey, monitoring, and inventory for species that are based on technically sound and logistically feasible methods while considering staffing and funding constraints.

Subsequently, the BLM requires conservation of Bureau sensitive or Bureau assessment species that are affected by their management actions. Options for conservation include but are not limited to:

**Table A7-1.—*BLM special status [1] and FS sensitive [2] animal species that are documented or suspected to occur within the Coos Bay, Medford, and Roseburg BLM Districts and the Siskiyou National Forest***

| Common name | Scientific name | Common name | Scientific name |
|---|---|---|---|
| American peregrine falcon | *Falco peregrinus anatum* | Brazilian free-tailed bat | *Tadarida brasiliensis* |
| Arctic peregrine falcon | *F. p. tundrius* | Columbian white-tailed deer [3] | *Odocoileus virginianus leucurus* |
| Bald eagle [3] | *Haliaeetus leucocephalus* | Fisher | *Martes pennanti* |
| Black-backed woodpecker | *Picoides articus* | Fringed myotis | *Myotis thysanodes* |
| Black-throated sparrow | *Amphispiza bilineata* | Townsend's big-eared bat | *Corynorhinus townsendii* |
| Common nighthawk | *Chordeiles minor* | Pacific pallid bat | *Antrozous pallidus pacificus* |
| Ferruginous hawk | *Buteo regalis* | Pacific shrew | *Sorex p. pacificus* |
| Lewis' woodpecker | *Melanerpes lewis* | California wolverine | *Gulo gulo* |
| Marbled murrelet [3] | *Brachyramphus m. marmoratus* | | |
| Northern goshawk | *Accipiter gentilis* | Montane peaclam | *Pisidium ultramontanum* |
| Northern spotted owl [3] | *Strix occidentalis caurina* | Vernal pool fairy shrimp [3] | *Branchinecta lynchi* |
| Northern waterthrush | *Siurus noveboracensis* | Newcomb's littorine snail | *Algamorda subrotundata* |
| Oregon vesper sparrow | *Pooecetes gramineus affinis* | Fall Creek pebblesnail | *Fluminicola* sp. nov. |
| Purple martin | *Progne subis* | Keene Creek pebblesnail | *Fluminicola* sp. nov. |
| Streaked horned lark | *Eremophila alpestris strigata* | Toothed pebble snail | *Fluminicola* sp. nov. |
| Three-toed woodpecker | *Picoides tridactylus* | Klamath Rim pebblesnail | *Fluminicola* sp. nov. 1 |
| Tricolored blackbird | *Agelaius tricolor* | Nerite pebblesnail | *Fluminicola* sp. nov. 11 |
| White-headed woodpecker | *Picoides albolarvatus* | Diminutive pebblesnail | *Fluminicola* sp. nov. 3 |
| White-tailed kite | *Elanus leucurus* | Oregon shoulderband | *Helminthoglypta hertleini* |
| Yellow-billed cuckoo | *Coccyzus americanus* | Sisters hesperian | *Hochbergellus hirsutus* |
| | | Scale lanx | *Lanx klamathensis* |
| Black salamander | *Aneides flavipunctatus* | Rotund lanx | *Lanx subrotundata* |
| California slender salamander | *Batrachoseps attenuatus* | Green sideband | *Monadenia fidelis beryllica* |
| Cascades frog | *Rana cascadae* | Travelling sideband | *Monadenia fidelis celeuthia* |
| Del Norte salamander | *Plethodon elongates* | Crater Lake tightcoil | *Pristiloma articum crateris* |
| Southern Torrent Salamander | *Rhyacotriton variegatus* | | |
| | | Insular blue butterfly | *Plebejus saepiolus insulanus* |
| Foothill yellow-legged frog | *Rana boylii* | Mardon skipper butterfly [3] | *Polites mardon* |
| Northern red-legged frog | *Rana a. aurora* | | |
| Siskiyou Mountains salamander | *Plethodon stormi* | | |
| Tailed frog | *Ascaphus truei* | | |
| Common kingsnake | *Lampropeltis getulus* | | |
| Northwestern pond turtle | *Clemmy m. marmorata* | | |

[1] As defined in the Bureau's Special Status Species Policy, BLM Manual 6840; data sort of the BLM Oregon State Office's database [04 April 2003].
[2] As defined in FS Manual 2670 [Webb, L., *personal communication*].
[3] These species are protected under the "Endangered Species Act" [1973, as amended].

a. Modifying a project (such as timing, placement, intensity or dropping);
b. using buffers to protect sites; and/or
c. implementing habitat restoration actions (those that benefit a species).

For Bureau tracking species, species-oriented inventories, environmental analysis, monitoring, protection, mitigation, management, and USFWS technical assistance are optional.

For State listed species, species-oriented inventories, protection, mitigation, management, and USFWS technical assistance are optional (BLM Instruction Memorandum No. OR-91-57).

The BLM conducts preproject clearances surveys for many special status species. Where surveys are done, they have a reasonable probability of locating individuals and populations of these species.

## Forest Service Sensitive Species

Forest Service policy is to not contribute to the need to list Forest Service sensitive species under the provisions of the “Endangered Species Act” and to conduct habitat examinations when proposed resource activities or uses would potentially make influential changes to elements of their habitat. Such examinations are usually required for Forest Service sensitive species unless the habitat is assumed occupied or prior surveys of the area are adequate. Predisturbance surveys can have several objectives including:

- Assessing potential sensitive species habitat;
- searching suitable habitat for sensitive species occurrence;
- confirming known habitat is suitable; and
- refining knowledge of how habitat exists on the landscape and how species use their habitat. This could include travel corridors, relationships between cover and forage areas, human disturbances, and fragile habitat situations.

The Forest Service sensitive species program includes species for which there is a documented concern for viability within one or more administrative units within the species' historic range (FS Manual 2670.22, Washington Office Amendment 2600-95-7). The designation of sensitive carries a requirement to analyze the impacts of projects and, frequently, to conduct surveys (FS Manual 2670). Forest Service sensitive species in the analysis area are listed in Table A7-1.

None of the Forest Service Sensitive species listed in Table A7-1 are dependent upon POC for habitat. Under all of the alternatives, known sites for these species will continue to be managed as necessary to preclude the need to list them under the "Endangered Species Act."

The Forest Service conducts pre-project clearances for many Forest Service sensitive species. Where surveys are conducted, there is a reasonable probability of locating individuals and populations of these species.

## Environmental Consequences

There are 57 special status/sensitive species identified in Table A7-1, including the northern spotted owl, marbled murrelet, bald eagle, and vernal pool fairy shrimp. The effects upon the threatened and endangered species have been analyzed above.

Queries of BLM and FS biologists have failed to yield information that would indicate that any species is specifically tied to POC (Dillingham 2003; Miller 2003; Webb 2003) or would be expected to be uniquely affected by the proposed alternatives. There are no known terrestrial wildlife species exclusively linked to POC. In general, the species found in the project area are tied more closely to habitat components. Impacts to these species are therefore similar to those analyzed for wildlife species, in general, in the Wildlife section in Chapter 3&4. The singular difference between the impacts to the wildlife species, in general, and special status/sensitive species are the provisions of the management direction which specifies survey requirements and special mitigation to lessen impact of management activities. Impact to special status/sensitive species should therefore be less than those analyzed in the general wildlife section.

*The following references were used in the Wildlife section of Appendix 7.*

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Miller, R.C. 2003. *Personal communication.* Wildlife Technician, USDA-FS Illinois Valley Ranger District, Siskiyou National Forest.

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USDA-FS; USDI-BLM. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl. Portland, OR. 322 p.

USDA-FS; USDI-BLM. 2000. Final Supplemental Environmental Impact Statement for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Regional Ecosystem Office, Portland, OR.

USDA-FS; USDI-BLM. 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Portland, OR. p. 130+.

USDA-FS; USDI-BLM. 2003. Survey and Manage Species Summary of Recommendations Regarding Category Placement and Range Changes from the 2002 Annual Species Review.

USDI-BLM. 1996a [updated 2002]. Western Oregon Districts Transportation Management Plan. Oregon/Washington State Office, Portland, OR. 36 p.

Webb, L.O. 2003. *Personal communication.* Forest Wildlife Biologist, USDA-FS Rogue River and Siskiyou National Forests, Grants Pass, OR.

## Botany

This section discusses the expected effects to Federal endangered, threatened, proposed, and candidate plant species, where applicable, under the "Endangered Species Act" (ESA) of 1973, as amended, by the alternatives. This section also discusses the expected influential changes, if any, to habitat of BLM Bureau sensitive and Bureau assessment species and to Forest Service sensitive species by each alternative.

### Threatened, Endangered, and Agency Sensitive Species

Implementation of any of these alternatives would result in a "No Effect" on these listed species:

- McDonald's rock cress *(Arabis macdonaldiana)*
- Gentner's fritillary (*Fritillaria gentneri*)
- Western lily *(Lilium occidentale)*
- Cook's lomatium *(Lomatium cookii)* (also known as agate desert-parsley)
- Kneeland Prairie pennycress *(Thlaspi californicum* [*montanum* var. *californicum*])

All requirements of the ESA would be fulfilled prior to implementation of specific projects.

The BLM requires the effects of a proposed action be assessed on Bureau Sensitive and Bureau Assessment species (BLM Instruction Memorandum No. OR-2003-054).

The Forest Service Sensitive Species program includes species for which there is a documented concern for viability within one or more administrative units within the species' historic range (FS Manual 2670.22; Washington Office Amendment 2600-95-7). Proposed projects that may impact Forest Service sensitive species must be analyzed and to develop conservation strategies where applicable (FS Manual 2670). This analysis satisfies the Forest Service biological evaluation requirement (FS Manual 2672.4).

Implementation of Alternatives 1, 2, 3, and 6 would have a "May Impact" on *Epilobium oreganum* individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause loss of viability for this species.

Implementation of Alternatives 4 and 5 would have a "May Impact" on *Epilobium oreganum*, *Gentiana setigera*, *Hastingsia bracteosa* var. *atropurpurea*, *Hastingsia bracteosa* var. *bracteosa*, and *Viola primulifolia* ssp. *occidentalis* individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause loss of viability for these species.

Implementation of Alternatives 1, 2, 3, and 6 would have a "No Impact" on all other sensitive plants.

### Discussion of Alternatives

**Alternative 1.** This alternative is the current management direction for BLM districts and the Siskiyou NF. It seeks to reduce or prevent introduction of the pathogen into disease-free areas by closing roads into these areas during the wet season to prevent the spores being carried from infested to uninfested areas, analyzing the risk of introduction to disease-free areas, developing mitigation measures at the project level, and informing the public about the reasons for these measure*s*.

Across the range of POC, areas with the highest presence of rare plants are primarily free of infestation, with the conspicuous exceptions of Whiskey Creek, narrow bands on the lower portions of Josephine Creek, and on the Middle Illinois River. Seasonal road closures and vehicle washing, mitigations for this alternative, prevent the introduction of noxious weeds and restrict unauthorized off-highway vehicles, thereby indirectly benefiting rare plants.

**Alternative 2.** This alternative is similar to Alternative 1, except for two items. A risk key has been added for clarification of the environmental conditions that would trigger additional control or mitigation measures. Implementation of disease mitigating practices is expected to be more consistent because of the key. Also, for activities within 162 currently uninfested 7th field watersheds, the risk key is hardwired to generally lead to the application of mitigating management practices whenever activities would create a significant risk of spreading root disease.

The effects of Alternative 2 are similar to Alternative 1, in that implementation would reduce the rate of spread of the disease. Continued development of resistant POC stock would be available for timely replacement into important botanical habitats. Alternative 2 would assist in maintaining the long-term presence of POC in unique plant communities, which appear to be more abundant in high-risk areas.

**Alternative 3.** To the management actions of Alternative 2 (except for reference to 162 7th field watersheds), Alternative 3 adds additional protection measures to 31 uninfested 6th field watersheds with at least 100 acres occupied by POC. It divides these watersheds into POC cores and buffers and applies additional Standards and Guidelines to each to lessen introduction of infestation into those areas.

The effects of Alternative 3 are the same as Alternative 2, with the exception of effects within the 31 uninfested watersheds. In these watersheds, the prohibition of harvest and discretionary use in POC cores would help ensure a lasting presence of POC in unique plant communities, which appear to be more abundant in high-risk areas. Closing roads and lessening unauthorized off-highway vehicles may benefit rare plant communities throughout the watersheds by preventing disturbances, such as noxious weed introductions, throughout the watersheds.

**Alternative 4.** This alternative would remove all preventive measures that are in place, and will speed up the resistance-breeding program to more quickly replace POC killed by the disease with resistant seedlings.

The effects of Alternatives 4 and 5 are similar, differing in the mid term and long term where Alternative 4 would mitigate advancement of the disease by increasing the introduction of resistant stock.

**Alternative 5.** This alternative would remove existing preventative measures and discontinue the development of the resistant breeding program. Existing resistant seed orchard trees would continue to be used to reforest areas of mortality for which resistant stock is already developed.

The effects of Alternatives 4 and 5 are similar, differing in the mid term and long term where Alternative 5 depends upon the natural, low-level disease resistance and range-wide distribution for the continued existence of POC.

Alternatives 4 and 5 would result in a substantial increase in the advancement of the disease when compared to the current direction. The effect of this high POC mortality on rare plants is unpredictable**.** POC is a large component of riparian habitats in areas where it is the largest tree species present. Loss of shade and stream bank stability that may result from the loss of POC could influence sensitive and rare plant communities adapted to stream microsites.

**Alternative 6.** This alternative would increase protection to 162 uninfested 7th field watersheds by minimizing entry for product collection, off-highway vehicle access, and timber harvesting. It also calls for roadside sanitation, eradication of infested areas as soon as discovered, and mapping PL-free water sources for firefighting.

Similar to Alternative 3, this alternative would reduce impacts to disease-free POC areas, and, by inference, impacts to rare plants and their habitat.

## Threatened and Endangered Species

The BLM and the FS conduct surveys for listed and proposed-for-listing plant species in and adjacent to proposed project areas. These surveys are designed to have a high likelihood of locating populations of these plant species. Because surveys for listed or proposed plant species will discover, and subsequently result in protection for these species with mitigation measures, there would be no difference between the six alternatives.

All projects proposed on BLM- or FS-administered land must meet the Aquatic Conservation Strategy objectives of the Northwest Forest Plan. As proposed projects are designed and analyzed for effects to listed plants, needs of the plant species and habitat elements required to meet Aquatic Conservation Strategy objectives will be identified.

There are no known threatened or endangered species specifically dependent on Port-Orford-cedar as a species, or individual Port-Orford-cedar groves specifically, so there is no identifiable effect resulting from the differing levels of mortality predicted with the different alternatives (see Table A7-2).

## BLM Bureau Sensitive or Bureau Assessment Species

The BLM special status species policy is applied to actions requiring authorization or approval by the Bureau to insure they are consistent with conservation needs of special status species, which include Bureau sensitive and Bureau assessment species, and do not contribute to the need to list them under the provisions of the ESA.

For Bureau sensitive or Bureau assessment species, the BLM requires review and assessment of potential effects, both beneficial and adverse, upon habitat considerations of each respective species. One or more of the following techniques may be used (BLM Instruction Memo-

**Table A7-2.—*Threatened [T] or endangered [E] vascular plants within the range of Port-orford-cedar*** [1]

| Common name | Scientific name | BLM | FS |
|---|---|---|---|
| MacDonald's rockcress | *Arabis macdonaldiana* [2] | E | E |
| Gentner's fritillary | *Fritillaria gentneri* | E | E |
| Western lily | *Lilium ocidentale* [2] | E | E |
| Cook's lomatium | *Lomatium cookii* [2] | E | E |
| Kneeland Prairie penny-cress | *Thlaspi californicum* [*montanum* var. *californicum*] | | E |

[1] Species listed as threatened or endangered under the "Endangered Species Act" [1973, as amended]. The lists of species were provided by the various field offices of the USFWs, which have jurisdiction over the range of POC area. Websites maintained by the agency were checked to track current changes to list proposed, threatened, and endangered species, and proposed and designated critical habitat.
[2] Species that occur in close proximity to POC.

randum No. OR-2003-054):

- Evaluation of species/habitat and presence of suitable or potential habitat;
- application of conservation strategies, plans, and other formalized conservation mechanisms;
- review of existing survey records, inventories, and spatial data;
- utilization of professional research, literature, and other technology transfer sources;
- use of expertise, both internal and external, that is based on documented, substantiated professional rationale; and/or
- complete pre-projects survey, monitoring, and inventory for species that are based on technically sound and logistically feasible methods, while considering staffing and funding constraints.

Subsequently, the BLM requires conservation of Bureau sensitive or Bureau assessment species that are affected by their management actions. Options for conservation include, but are not limited to:

a. Modifying a project (such as timing, placement, intensity, or dropping);
b. using buffers to protect sites; and/or
c. implementing habitat restoration actions (to benefit a species).

The BLM conducts pre-project clearances surveys for many special status species. Where surveys are done, they have a reasonable probability of locating individuals and populations of these species. Because surveys for special status species will discover them and the Agency will subsequently protect them as needed, there are no differences between the alternatives. Bureau Sensitive and Bureau Assessment species listed in Table A7-3 will not be impacted by any of the alternatives.

## Forest Service Sensitive Species

Forest Service policy is to not contribute to the need to list Forest Service sensitive species under the provisions of the ESA and to conduct habitat examinations when proposed resource activities or uses would potentially make influential changes to elements of their habitat. Such examinations are usually required for Forest Service Sensitive species unless the habitat is assumed occupied or prior surveys of the area are adequate. Pre-disturbance surveys can have several objectives including:

**Table A7-3.—*Vascular plants listed as BLM Bureau sensitive/assessment and Forest Service sensitive documented or suspected within close proximity of Port-Orford-cedar***

| Common name | Scientific name | BLM [1] | FS [2] |
|---|---|---|---|
| Siskiyou sedge | *Carex gigas* | BA | R6 |
| Siskiyou Indian paintbrush | *Castilleja miniata* ssp. *elata* | | R5 |
| Clustered lady's slipper | *Cypripedium fasciculatum* | BS | R5/R6 |
| Oregon willow-herb | *Epilobium oreganum* | BS | R5/R6 |
| Siskiyou daisy | *Erigeron cervinus* | BA | R5/R6 |
| Scott Mountain fawn lily | *Erythronium citrinum* var. *roderickii* | | R5 |
| Henderson's fawn lily | *Erythronium hendersonii* | | R5 |
| Waldo gentian | *Gentiana setigera* | BS | R6 |
| Purple rush-lily | *Hastingsia bracteosa* var. *atropurpurea* | BS | R6 |
| Large-flowered rush-lily | *Hastingsia bracteosa* var. *bracteosa* | BS | R6 |
| Dudley's rush | *Juncus dudleyi* | | R5 |
| Parnasia | *Parnasia palustris* | | R5 |
| Del Norte butterwort | *Pingicula vulgaris* ssp. *macroseras* | | R5 |
| California sworfern | *Polystichum californicum* | BA | R6 |
| Crested polentilla | *Potentilla cristae* | | R5 |
| Showy raillardella | *Raillardella pringlei* | | R5 |
| Del Norte willow | *Salix delnortensis* | BA | R6 |
| Great burnet | *Sanguisorba officinalis* | | R5 |
| English Peak greenbriar | *Smilax jamesii* | | R5/R6 |
| Western bog violet | *Viola primulifolia* var. *occidentalis* | BS | R5/R6 |

[1] BS = Bureau sensitive; BA = Bureau assessment.
[2] Forest Service Regions: R5 = California; R6 = Oregon.

- Assessing potential sensitive species habitat;
- searching suitable habitat for sensitive species occurrence;
- confirming that known habitat is suitable; and
- landscape analysis to refine knowledge of existing habitat conditions and how species adapt. This could include relationships between cover and forage areas, human disturbances, and fragile habitat situations.

Within the range of POC, Table A7-3 lists Forest Service sensitive species in Regions 5 (California) and 6 (Oregon). The Forest Service sensitive species program includes species for which there is a documented concern for viability within one or more administrative units within the species' historic range (FS Manual 2670.22, Washington Office Amendment 2600-95-7). The designation of sensitive carries a requirement to analyze the impacts of projects and to conduct surveys if disturbance occurs (FS Manual 2670).

The FS conducts pre-project clearances for many FS sensitive species. Where surveys are conducted, there is a reasonable probability of locating individuals and populations of these species. Because surveys for FS sensitive species will discover them and the Agency will protect them as needed, there are no differences between the alternatives. FS sensitive species listed in Table A7-3 would not be impacted by any of the alternatives except a noted above.

There are no known Bureau sensitive, Bureau assessment, or FS sensitive species specifically dependent on POC as a species, or individual POC groves specifically; so there is no identifiable effect resulting from the differing levels of mortality predicted with the different alternatives. There are questions that have not been answered by current knowledge about the interactions in fen plant communities and their relationship. The latest fen survey results indicate that *Epilobium oreganum* prefers habitats with grown trees and shrubs (Frost 2003).

*The following references were used in the Botany section of Appendix 7.*

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# Fisheries

## BLM Special Status and FS Sensitive Species

This fisheries biological evaluation addresses BLM special status and FS sensitive species:

- Chinook salmon (*Oncorhynchus tshawytscha*) — BLM and FS sensitive
- Steelhead trout (*Oncorhynchus mykiss*) — FS sensitive
- Coastal cutthroat trout (*Oncorhynchus clarkii*) — FS sensitive
- Chum salmon (*Oncorhynchus keta*) — FS sensitive

Implementation of Alternatives 1, 2, 3, or 6 is not likely to lead to a trend towards Federal listing of steelhead, coastal cutthroat trout, Chinook salmon, and chum salmon.

Implementation of Alternatives 4 or 5 may lead to a trend towards Federal listing of steelhead, coastal cutthroat trout, chinook salmon, and chum salmon.

**BLM Special Status Species.** The BLM special status species policy applies to all actions requiring authorization or approval by the Bureau to insure those actions are consistent with conservation needs of these species and do not contribute to the need to list them under the provisions of the "Endangered Species Act" (ESA). BLM special status species are as follows: Federal endangered, threatened, proposed and candidate species; state endangered and threatened species; Bureau sensitive; Bureau assessment; and Bureau tracking.

Chinook salmon is designated as Bureau sensitive. For Bureau sensitive or Bureau assessment Species, the BLM requires review and assessment of potential effects, both beneficial and adverse, of proposed actions. NEPA decision documents must disclose the effects of proposed actions on these species, and document that the decision would not contribute to the need to list under the ESA (BLM Instruction Memorandum No. OR-2003-054).

**Forest Service Sensitive Species.** This basic policy is to not contribute to the need to list Forest Service sensitive species under the provisions of the ESA, and to conduct habitat examinations when proposed resource activities or uses would potentially make influential changes to elements of their habitat. Examinations of suitable habitat are usually required for Forest Service sensitive species unless the habitat is assumed occupied or prior surveys of the area are adequate.

The Forest Service sensitive species program includes species for which there is a documented concern for viability within one or more administrative units within the species' historic range (Forest Service Manual 2670.22, Washington Office Amendment 2600-95-7). The designation of sensitive carries a requirement to analyze the impacts of projects and, frequently to conduct surveys (Forest Service Manual 2670).

Although coho salmon *(Oncorhynchus kisutsch)*, are federally threatened and are therefore, by definition BLM special status species, this biological evaluation does not address potential effects to coho salmon. The analysis and determination of effects specific to coho salmon is addressed through a separate biological assessment as required by the ESA through section 7 consultation with the National Marine Fisheries Service.

## Existing Environment and Habitat Status

Of the four sensitive species, steelhead are the most abundant and widely distributed throughout the POC SEIS analysis area, and are present in streams ranging from small 2nd to 3rd Order tributaries to mainstem rivers. Cutthroat trout are also present in the same range of stream sizes, but are more abundant in the coastal regions of the analysis area. Chinook and chum salmon are relatively more abundant in low gradient gravel-rich channels associated with large tributaries and mainstem river valleys. Baseline habitat conditions are described in the Water and Fisheries section in Chapter 3&4 of this SEIS. Baseline habitat conditions are also summarized in the 1997 Rogue Valley Council of Governments report, "Southwest Oregon Salmon Restoration Initiative, Phase 1: A Plan to Stabilize the Native Steelhead Population in Southwest Oregon from Further Decline." This report identified six primary limiting factors for steelhead streams in the Rogue, Klamath, and South Coast (Prevost et al. 1997, *p. 12–13*) Due to general similarities in anadromous life histories and freshwater habitat requirements, these six factors to be applicable to cutthroat trout, Chinook salmon, and chum salmon:

1) Low stream flows limit summer rearing habitat, increase water temperatures, and increase competition and the risk of predation.

2) High water temperatures (over 21 degrees C), produced by insufficient cover, can foster disease and diminish food supply.

3) Inadequate riparian habitat exists. Stream canopy over side-channels and alcoves provides shade which helps reduce stream temperatures, stabilizes streambanks, serves as holding areas for fry and smolts, and provides a food source for aquatic life.

4) Inadequate levels of instream large woody debris exist. Large woody debris provides shelter for steelhead, creates pools, collects spawning gravel, helps reduce water velocity, and provides hiding habitat.

5) Sediment and erosion were limiting factors, as they affect spawning areas, fishery health, and water quality.

6) Fish passage at road crossings needs improvement.

## Environmental Consequences

Because the relative importance of POC as woody debris for salmonid habitat depends on the proportion of POC in the headwaters, the potential impacts of the loss of POC will vary by watershed and basin. As wood source areas, ultramafic headwater POC-dominated and sparsely-vegetated areas would likely be the most affected by POC loss, while headwater areas that contain denser stands of other conifers will be less affected. Therefore, it is likely that over the long term (centuries) and on a large-basin scale, as the sources of POC decline, the subsequent proportion of POC in wood jams that contribute to salmonid habitat will decrease, except as mitigated by replacement with resistant stock (see Planting Assumption early in Chapter 3&4).

POC root disease infestations in streamside POC stands may lead to long-term increases of large wood recruitment to channels. Mortality and subsequent declines in root strength in streamside POC may result in more dead trees that are susceptible to storm windthrow or localized undercutting by stream currents, especially on the outside of channel bends. POC trees that topple into the streams would create scour pools in the medium width channels and become parts of jam complexes or distributed downstream on the floodplains in wider channels. Over the long-term this may result in beneficial effects for aquatic habitat by providing increased pool depths, complex habitats, and cover. However, the potential for beneficial effects from increases in large wood depend several site-specific conditions, including POC density and channel geomorphological characteristics. For example, in wide floodplains where significant portions of dead POC are present, a large reduction in root networks may cause the channel to become less stable, move laterally across the floodplain, and become wider, shallower, and/or braided.

In most of the area, infected POC with dead crowns may contribute to more expansive holes in the canopy in riparian areas along streams. Infections of POC with PL would result in lesser amounts of shade than a healthy stand. On soils derived from ultramafic materials, shading may be reduced for long time periods. Other tree species have difficulty occupying the site due to waterlogged soils with unfavorable soil chemistry. Therefore, a lag time can be expected where alder, tanoak, or other pioneer hardwood species invade openings on many POC riparian sites. Alder and other hardwoods will sometimes provide shade over streams within 3 to 5 years of colonization. Hardwoods, as they mature, are less desirable as downed material for stream function because they are often of smaller diameter than conifers and do not last as long. Whether conifers eventually become established in these streamside areas depends on site conditions and disturbance history.

## Effects of the Alternatives

**Alternative 1.** There is some risk to fish from the use of Clorox. PL-contaminated waters used for washing and firefighting would be disinfected with a 50 parts per million concentration of sodium hypochlorite, the active ingredient in Clorox bleach. Two fish-killing spills were reported during suppression of the Biscuit Fire from tanker fills located next to streams. A mitigation was subsequently implemented of adding Clorox to water only after tanks have been filled and moved away from the fill site. Continuation of this practice would substantially decrease the risk of this type of spill. Wash stations would be located to avoid direct flow of treated water into streams and other bodies of water, so there should be little or no effect to fish from that source. Direct input of chlorinated waters could result from fire suppression activities and would be small in scale and of short duration.

**Alternative 2.** The Clorox risk discussed in Alternative 1 applies to Alternative 2 as well.

**Alternatives 3 and 6.** These alternatives incorporate the features of Alternative 2, and add additional measures to control the spread of PL within 31 and 162 currently uninfested subwatersheds (generally 10,000 to 40,000 acres) and catchments (generally 1,000 to 10,000 acres) respectively. The Alternative 6 uninfested drainages are more widely distributed throughout the POC range than those of Alternative 3, excluding the Coos Bay and Roseburg BLM Districts, and include most of the core areas of Alternative 3. Alternative 3 features a larger acreage of watershed buffers (460,500 acres) throughout the POC range, when compared to Alternative 6 watershed buffers (216,000 acres). These POC buffers in Alternative 3 surround substantially greater miles of anadromous fish streams, when compared to Alternative 6.

Discontinuance of travel and maintenance on certain winter use roads to lesson PL spread, may also coincidently reduce sediment delivery to stream channels. This effect is variable depending on road location, surface type, adequacy of drainage structures, and closure level. Transportation analysis and management objectives for buffers in Alternatives 3 and 6 would give these alternatives the greatest indirect beneficial impact on water quality and salmonids.

In Alternative 3 and 6 management measures for water sources require mapping and using only untreated water from the uninfested watersheds for wildfire suppression. The risk of the Clorox water treatment additive from being washed into streams from mixing areas or dumping of treated water during fire suppression would be eliminated in these watersheds. These water management practices would have a beneficial effect on fishes and biota, by preventing spills and short-term water-chemistry changes. The Clorox risk discussion in Alternative 1 also applies to other parts of Alternative 3 and 6.

**Alternatives 4 and 5.** Alternatives 4 and 5 are similar in that no specific management measures would be applied, other than a root disease resistant POC breeding program in Alternative 4 and general discontinuance of the breeding program in Alternative 5. In the Northern/Coastal Region effects on fish would also be similar to Alternatives 1 and 2 in the short and long term. This is because POC is a minor riparian species in this region and 75 percent of the riparian areas are already infested in many of the lower drainages. Additionally, edaphic conditions suggest that other tree species can easily occupy most sites in this area. Alternative replacement species including hardwoods like red alder or conifers including western red cedar and western hemlock would most likely occupy the site. Planted POC would be small and would not provide effective shade or large woody debris recruitment for many decades.

In the Siskiyou and Inland Siskiyou Risk Regions, Alternatives 4 and 5 would be less favorable than Alternatives 1, 2, 3, and 6 in the short and long term. Currently about 27 percent and 15 percent respectively of POC of high-risk riparian areas are infested. An additional 62 percent and 68 percent of the high-risk areas in these risk regions are predicted to become infested in the next 100 years under Alternative 4 and 5, while an additional 16 to 25 percent would become infested under Alternative 3 and 2 in the same period. Seed would be available for planting resistant stock under Alternative 4 after 2010, and is not planned for some areas under Alternative 5.

## Cumulative Effects of the Alternatives Specific to Downstream Temperature

The comparison of downstream cumulative temperature effects under all alternatives is that Alternative 3 (due to expanded buffer areas) has the least effect; Alternative 6 has slightly more effect; Alternatives 1 and 2 have an increased effect and are almost the same; and Alternatives 4 and 5 have the greatest effect and are equal at least in the short and mid term.

Approximately 25 percent of the salmonid habitat would be potentially affected by the cumulative downstream impact of temperature increases in ultramafic streams (based on analysis of the entire POC range in Oregon for the miles of steelhead streams that are ODEQ 303(d) listed for temperature and are in ultramafic terrain). The portion of high-risk areas that would be affected are approximately 9 percent for Alternatives 3 and 6, 13 and 12 percent for Alternatives 1 and 2, respectively, and 21 percent for Alternatives 4 and 5. The potential cumulative effects to fish would not be significant under Alternatives 1, 2, 3, and 6.

The cumulative effects potentially would be significant for steelhead under Alternatives 4 and 5.

These effects on steelhead and cutthroat trout are also attributed to their abundance and broad range in life history characteristics. Steelhead and cutthroat trout abundance in the region is relatively stable; they are both widely distributed, are both able to use a variety of stream habitats, and are therefore expected to be resilient to disturbance. However, Chinook and chum salmon would not be likely to be impacted by indirect temperature effects on rearing habitat due to the timing of their use of the habitat. Juvenile salmon emigrate from spawning areas during their first spring and so are not typically using tributaries in the upper watersheds affected by elevated temperatures in the summer months.

The effects discussion that follows provides more detailed descriptions of potential effects by risk region (North Coast, Siskiyou, and Inland Siskiyou Risk Regions).

**North Coast Risk Region (Coos Bay BLM District, Siskiyou NF Powers Ranger District).** The loss of POC under any of the proposed alternatives would not have a detectable effect on fish in this region. In this region, POC is generally a scattered component of riparian stands. Gaps in the canopy created by dying crowns are small and spatially distributed so average crown density is not reduced at a reach-scale of analysis. Spaces in the canopy would be filled rapidly by adjacent trees broadening their canopies, release of understory trees, or seeded trees. Summer temperatures and large woody debris recruitment would be maintained within the natural range of variability in headwater, mid-drainage, and valley streams.

**The Siskiyou Risk Region (Siskiyou NF in Oregon and Six Rivers, Klamath, and Shasta-Trinity NF in California).** The loss of POC on headwater streams in this region under any of the proposed alternatives will not have a detectable effect on fish because summer temperatures would not be elevated and the function of large woody debris transport would be maintained. Loss of POC on mid-drainage and valley streams within the nonultramafic portions of this region would not have a detectable effect on fish for the same reasons stated above in the Northern/Coastal Region (that is, other conifer species gradually replace POC, and summer temperatures and large woody debris function are maintained). In the lower rainfall ecoregions to the east of the Coastal Siskiyous boundary, species present with POC along creeks in nonultramafic soils would be expected to colonize the canopy gaps left by POC loss.

Mid-drainage and valley streams within ultramafic areas of this region would be affected by the loss of POC. Because POC mortality on these streams is not predicted to disrupt the recruitment of large woody debris, no effects to fish are anticipated related to its function (such as, pool formation, instream complexity, gravel recruitment). However, the loss of POC stream shade and the associated elevation of summer temperatures on these streams could have an indirect short- and long-term effect on fish. For salmonids, this effect would not be significant under any alternative because of the very limited habitat area it involves (6 percent of the total habitat).

The indirect effect that elevation of summer temperatures could have on salmonids in the ultramafic drainages affected by POC mortality would be a decrease in habitat quality in stream reaches that are directly associated with POC overstory canopy. However, the significance of this potential decrease in the ultramafic areas must be placed in context of the importance of those areas for salmonid production in the region. The analysis of the impacts of POC loss on streams using plant association groups indicates that a small percentage of the stream miles in ultramafic soils would be directly affected by the loss of POC. Of the total 897 miles of streams in the Serpentine Plant Association Groups east of the Coastal Siskiyous, 192 miles (21 percent) would be affected, and within these miles, POC contributes 38 to 50 percent of the overstory. Therefore, the loss of POC on stream segments in the ultramafic areas would not be anticipated to have a significant short or long term effect on salmonids under any alternative because of the very limited habitat area it involves (6 percent of the total habitat), the limited shade loss that could actually result on a given segment of stream.

**Inland Siskiyou Risk Region (Medford and Roseburg BLM Districts).** In this region, the loss of POC under any of the proposed alternatives would not have a detectable effect on fish. POC lost to PL in riparian zones would gradually be replaced by other conifer species. In the Medford District, the loss of POC on headwater streams under any of the proposed alternatives would not have a detectable effect on fish because summer temperatures would not be elevated and the function of large woody debris transport would be maintained. In the Roseburg District, summer temperatures and large woody debris recruitment would be maintained within their natural range of variability in headwater streams and mid-drainage and valley streams.

The loss of POC stream shade and the associated potential elevation of summer temperatures in mid-drainage and valley streams within ultramafic areas of this region would have an indirect short- and long-term effect on fish. The effects are the same as described above for the mid-drainage and valley streams within the ultramafic areas of the Siskiyou Region.

*In addition to the information provided in this SEIS, the following references were used in the Fisheries section of Appendix 7.*

Busby, P.J.; Wainwright, T.C.; Bryant, G.J.; [and others]. 1996. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. U.S. Deptartment of Commerce, NOAA-Fisheries Technical Memorandum NMFS-NWFSC-27. 261 p.

Johnson, O.W.; Ruckleshaus, M.H.; Grant, W.S.; [and others]. 1999. Status Review of Coastal Cutthroat Trout from Washington, Oregon, and California. U.S. Deptartment of Commerce, NOAA-Fisheries Technical Memorandum NMFS-NWFSC-37. 292 p.

Myers, J.M.; Kope, R.G.; Bryant, G.J.; [and others]. 1998. Stat us Review of Chinook Salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA-Fisheries Technical Memorandum NMFS-NWFSC-35. 443 p.

Rogue Valley Council Of Governments. 1997. Southwest Oregon Salmon Restoration Initiative, Phase 1: A Plan to Stabilize the Native Steelhead Population in Southwest Oregon from Further Decline. Central Point, OR.

# Appendix 8: Areas of Critical Environmental Concern and Research Natural Areas and Requirements for Designation

## Areas of Critical Environmental Concern

This appendix explains ACEC criteria as described in 3 CFR 16 and describes the existing and proposed ACECs and their relevant and important values (Tables A8-1 and A8-2). BLM regulations (43 CFR 1610) define an ACEC as an area

> . . . within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

ACECs differ from other special management designations such as wilderness study areas in that the designation, by itself, does not automatically prohibit or restrict other uses in the area. The one exception is that a mining plan of operation is required for any proposed mining activity within an ACEC. The ACEC designation is an administrative designation and is accomplished through the land use planning process. It is unique to the BLM in that no other agency uses this form of designation. The intent of Congress in mandating the designation of ACECs through the "Federal Land and Policy Management Act" was to give priority to the designation and protection of areas containing truly unique and significant resource values.

**Table A8-1.—*Areas of critical environmental concern and research natural areas within the range of Port-Orford-cedar in Oregon that contain healthy Port-Orford-cedar or are infested with* Phytophthora lateralis**

| | POC/ PL [1] | Acres | Primary objectives | Off-highway vehicle designation | Leasable mineral entry | Locatable/ salable mineral entry | Timber harvest |
|---|---|---|---|---|---|---|---|
| ***Coos Bay BLM*** | | | | | | | |
| New River ACEC | PL | 880 | Dune blocked lake with aquatic beds, marshy shore, surrounded by unconsolidated sands | Closed/ limited | Open/NSO | Closed | Not available |
| Upper Rock Creek ACEC | POC | 460 | | Limited | Open/NSO | Closed | Not available |
| North Fork Hunter Creek ACEC | POC | 1,730 | Coastal oak-conifer woodland and meadow mosaic | Limited | Open/NSO | Closed | Not available |
| Hunter Creek Bog ACEC | PL | 570 | Knobcone pine forest; *Darlingtonia* fen on serpentine peridotite w/POC | Limited | Open/NSO | Closed | Not available |

[1] Uninfested ACECs or RNAs are indicated by the letters POC; infested ACECs or RNAs are indicated by the letters PL. The number of acres of POC or PL infestation are not available for any of the ACECs or RNAs.

**Table A8-2.—*Areas of critical environmental concern and research natural areas within the range of Port-Orford-cedar in Oregon that contain healthy Port-Orford-cedar or are infested with* Phytophthora lateralis**

| Area Name | POC/ PL [1] | Acres | Primary objectives | Management |
|---|---|---|---|---|
| ***Medford BLM*** | | | | |
| Brewer Spruce ACEC/RNA | POC | 390 | Brewer spruce forest and aquatic cell for mid- to high-elevation permanent pond. | Not available for timber harvest. OHV use restricted to designated roads. Mineral leasing subject to NSO. Close to mineral entry. |
| Woodcock Bog ACEC/RNA | PL | 280 | *Darlingtonia* wetland on serpentine and special status plant species. | Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry. |
| Bobby Creek ACEC/RNA | POC | 428 | Natural systems, botanical, special status species, and wildlife fisheries. | Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO. 428 acres designated as ACEC and 1,702 acres designated as RNA. |
| Rough and Ready ACEC/RNA | POC | 1,164 | Natural systems, special status plants, botanical. | Not available for timber harvest. OHV use limited to designated roads. Mineral leasing subject to NSO. |
| Bobby Creek ACEC/RNA | POC | 1,702 | Natural systems, botanical, special status species, and wildlife fisheries; moist tanoak forests [tanoak/Port-Orford-cedar/salal]. | Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO. 428 acres designated as ACEC and 1,702 acres designated as RNA. |
| Brewer Spruce Enlargement ACEC/RNA | POC | 1,384 | Natural area of Brewer spruce forest for scientific research and baseline study area. | Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry. |
| Grayback Glade ACEC/RNA | POC | 1,069 | Terrestrial white-fir-Port-orford-cedar and aquatic first order stream for scientific research and baseline study area. | Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry. |
| North Fork Silver Creek ACEC/RNA | POC | 499 | Douglas-fir/white fir forest with diverse shrub understory and third order stream; for scientific research and baseline study area. | Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry. No surface disturbance within 100 feet of boundary. |
| Pipe Fork ACEC/RNA | POC | 529 | Port-orford-cedar/Oregon grape and Port-orford-cedar/salal communities; for scientific research and baseline study area. | Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry. |

| Area Name | POC/ PL [1] | Acres | Primary objectives | Management |
|---|---|---|---|---|
| ***Roseburg BLM*** | | | | |
| Beatty Creek | POC | 180 | Jeffrey Pine on Serpentine. | ACEC/RNA |
| ***Siskiyou National Forest*** | | | | |
| Cedar Log Flat | POC | 421 | Port-Orford-cedar/hairy honeysuckle/fescue on ultramafic soils. Jeffrey pine grassland savannah. | RNA |
| Coquille River Falls | PL | 470 | Douglas-fir, Western hemlock, Port-Orford-cedar forest with wet shrubs and forbs. | RNA |
| Lemmingsworth Gulch | POC | 1,224 | Port-Orford-cedar/hairy honeysuckle/fescue on ultramafic soils. | RNA |
| Port-Orford-Cedar | PL | 1,122 | Douglas-fir, Western hemlock, Port-Orford-cedar forest with wet shrubs and forbs. Low elevation pond with aquatic beds and marshy shore. Oregon ash, red alder swamp. | RNA |
| ***Siuslaw National Forest*** | | | | |
| Tenmile | POC | 1,190 | Sitka spruce-Port-Orford-cedar on sand. | RNA |

[1] Uninfested ACECs or RNAs are indicated by the letters POC; infested ACECs or RNAs are indicated by the letters PL. The number of acres of POC or PL infestation are not available for any of the ACECs or RNAs.

## Research Natural Areas

According to Oregon Natural Heritage Program (ONHP) (ONHP 1993, 1998) the purpose for research natural areas (RNAs) are:

> . . . to preserve examples of all significant natural ecosystems for comparison with those influenced by man; to provide educational and research areas for ecological and environmental studies; and to preserve gene pools of typical and endangered plants and animals.

The FS recognizes the role of RNAs in sound land use management and has provided for RNA establishment and management in FS Manual 4063. The basic policy is that RNAs may be used only for research, study, observation, monitoring, and those educational activities that maintain unmodified conditions (FS Manual 4063.03). The guiding principle of RNA management is to allow the natural ecological processes occurring in the area to predominate. Human encroachments, activities and management implications, which directly or indirectly modify natural ecological processes, generally are to be mitigated with active management.

RNAs of the FS are lands that are permanently protected for the purposes of maintaining biological diversity, conducting nonmanipulative research and monitoring, and fostering education. In RNAs, natural conditions are allowed to prevail, usually by eliminating or limiting human intervention. In many cases, however, human activities have interrupted natural processes for several decades or more. In these cases, prescribed management actions are used to restore the processes upon which the natural communities and species depend.

Pursuant to FS Manual 4063, in consultation with Forest Supervisors and District Rangers, Station Directors have authority to approve all management plans and to oversee and coordinate approved research on all RNAs, except those RNAs in congressionally designated areas. District Rangers are responsible for direct administration, protection, and, in accordance with approved forest plans and/or project prescriptions, management of established RNAs. Forest Supervisors have the responsibility to execute approved management plans for RNAs and to administer, manage, and protect RNAs. Forest Supervisors must coordinate with the Station Director or Director's representative any needed changes in management or protection.

All BLM RNAs are designated and managed as ACECs (Oregon Manual Supplement 1623.35 for RNAs only). Therefore, all RNAs must meet both the ACEC criteria, as applied in writing by an interdisciplinary team and approved by the field manager, as well as the need for a RNA cell as defined in the ONHP data base. The ACEC can be larger than the RNA, to encompass other values, which may not be needed for the RNA. RNA management plans are usually more restrictive than ACEC plans. RNA cells determined by the ONHP are the basic units that are represented in a natural area system. These cells can be an ecosystem, community, habitat, or organism. Cells are artificial constructs used by the ONHP to inventory, classify, and evaluate natural areas in Oregon. Cells contain one or more ecosystem elements. Typically, a RNA aggregates several cells that need representation. The ONHP was created by the Oregon Natural Heritage Advisory Council to the State Land Board in 1993. They are the State counterpart of the Federal program. Of the 16 existing and proposed ACECs, 13 have ONHP cells within their areas. Within the existing and proposed ACECs, 11 have existing or proposed RNAs.

## Requirements for Area of Critical Environmental Concern Designation

To be designated as an ACEC, an area must meet the relevance and importance criteria listed in BLM 1613 Manual (BLM 1988) and require special management. Specific evaluation questions for each of these three elements are listed below.

### Relevance Criteria

Does the area contain one or more of the following:

- A significant historic, cultural, or scenic value;
- a fish and wildlife resource;
- a natural process or system; or
- a natural hazard?

### Importance Criteria

Does the value, resource, system, process, or hazard described above have substantial significance or value? Does it meet one or more of the following criteria?

- Is it more than locally significant, especially compared to similar resources, systems, processes, or hazards within the region or Nation;

- does it have qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change;

- has it been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of the "Federal Land and Policy Management Act";

- does it have qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare; or

- does it pose a significant threat to human life and safety or property?

### Need for Special Management

Does the value, resource, system, process, or hazard require special management to protect (or appropriately manage) the relevant/important value(s)? Special management is defined as or is needed when:

1) Current management activities are not sufficient to protect a given relevant/important resource value and a change in management is needed that is not consistent with the existing land use plan(s).

2) The needed management action is considered unusual or outside of the normal range of management practices typically used.

3) The change in management is difficult to implement without ACEC designation.

### Evaluation Process

Regardless of who nominates an area as a potential ACEC, it is the BLM who is responsible for evaluating the area to determine if it meets the relevance/importance criteria and requires special management.

# Appendix 9: Summary of Modeled Potential Stream Temperature Increases Resulting from Port-Orford-Cedar Mortality

To help identify sideboards to the affect of POC mortality on stream temperatures, the following scenarios were run on the stream SHADOW model, Version X-15 (Parks 1993). Mortality of POC is expected to have the largest affect on stream temperature on ultramafic soils, where (1) overall vegetation is less than on other soil types, (2) POC is more prominent along stream sides compared to other species, and (3) POC is less likely to be replaced by other species if it is lost. The model was run for 10 (cases 1, 2, and 3) and 40 (cases 4, 5, and 6) square mile drainages. Latitude is 43 degrees, solar declination is 17 degrees (August 1), and ground temperature is 53 degrees. Modeling parameters are shown in Table A9-1.

These parameters assume 100 percent POC within the first 15 feet from the stream channel for a mile (POC averages 50 percent of the overstory canopy in the 10,600 acres of riparian ultramafic plant associations in Oregon in which it is prominent [Table 3&4-12]), and 100 percent kill for the 15 feet on either side of the channel, and zero kill beyond that distance. Results of conduction, convection, inflow, etc., were not modeled. The results of the temperature modeling are shown in Table A9-2.

**Table A9-1.—*Mortality parameters for SHADOW stream temperature effects***

| | Uninfested | | Infested | |
|---|---|---|---|---|
| | Drainage size [square miles] | | Drainage size [square miles] | |
| Modeling Element | 10 | 40 | 10 | 40 |
| % tree overhang | 15 | 15 | 0 | 0 |
| Flow width [feet] | 8 | 17 | 8 | 8 |
| Active channel width [feet] | 30 | 60 | 30 | 30 |
| Modeled length [9 miles] | 1 | 1 | 1 | 1 |
| Low flow [August 1] [cu.ft./sec.] | 2.2 | 8.8 | 2.2 | 2.2 |
| Tree height [relatively low on ultramafic] [feet] | 130 | 130 | 130 | 130 |
| Slope of adjacent terrain [%] | 20 | 10 | 20 | 20 |
| Distance from channel edge to trees [feet] | 2 | 2 | 15 | 15 |
| Shade density of unaffected [adjacent] stand [%] | 70 | 55 | 70 | 70 |

**Table A9-2.—*Summary of predicted shade decrease and temperature increase for August 1, comparison of uninfested and infested riparian areas with 100 percent Port-Orford-cedar***

| | Uninfested Port-Orford-cedar | | Infested Port-Orford-cedar | | Comparison | |
|---|---|---|---|---|---|---|
| Case [1] | % shade | Temperature [C] increase/mile | % shade | Temperature [C] increase/mile | % shade decrease/mile | Temperature [C] increase/mile |
| 1 | 86 | 1.6 | 77 | 2.7 | 9 | 1.1 |
| 2 | 88 | 1.4 | 77 | 2.7 | 11 | 1.3 |
| 3 | 88 | 1.4 | 74 | 3.0 | 12 | 1.6 |
| 4 | 70 | 1.8 | 61 | 2.3 | 9 | 0.5 |
| 5 | 69 | 1.9 | 58 | 2.6 | 11 | 0.7 |
| 6 | 49 | 3.0 | 30 | 4.2 | 19 | 1.2 |

[1] Case 1 and 4 are north-south orientation [0 degrees N]; case 3 and 6 are east-west orientation [90 degrees N]; and case 2 and 5 are intermediate [45 degrees N].

# Appendix 10: Response to Public Comments

## Introduction

The public comment period for the Draft Supplemental Environmental Impact Statement for Management of Port-Orford-cedar in Southwest Oregon (Draft SEIS) began on June 13, 2003 and ran through September 12, 2003. Agencies, officials, and the public were invited to comment on the Draft SEIS.

During the 90-day public comment period, 45 communications were received in the form of letters, postcards, facsimiles, and e-mails (collectively referred to as letters). Letters were received from a variety of interests.

All of the letters received during the public comment period were read in their entirety by members of the SEIS Interdisciplinary Team, and substantive comments were compiled into "comment statements." Comment statements are summary statements that identify and describe specific issues or concerns identified in the letters. Unique concerns generated unique comment statements; similar concerns voiced in multiple letters were grouped into one comment statement. Letters or comments were not considered "votes". All letters are treated equally and are not given weight by number, organizational affiliation, or other status of the respondents. The comment statements were reviewed and the Agencies used information provided in the letters in the preparation of the Final SEIS.

Four letters were received in the 45 days following the close of the comment period. These letters were reviewed and any substantive information they contained was also considered in the preparation of the Final SEIS.

Several areas of controversy were raised in comment letters. These areas of controversy with a brief explanation of how they were addressed in the Final SEIS are listed below. This is not a complete summary of all public comments received.

## Organization

This appendix contains the comment statements and responses. After analyzing the comment statements as described above, the Interagency SEIS Team grouped the related topics to avoid duplication and, then, responded to the comments. The Team received numerous form letters, or slightly revised versions thereof: Comment letter numbers of form letters are not included as part of the Comments responded to in the section that follows. Table A10-1 shows these letters and refers the reader to the "master" letter number where their comments can be found. The comments and responses are intended to be explanatory in nature; if there are any inadvertent contradictions between Appendix 10 and the text of the Final SEIS, the Final SEIS prevails.

Letters received during the comment period from Federal agencies, state and local governments, American Indian tribes, and elected officials are reproduced and included in Appendix 11.

**Table A10-1.—*Draft POC-SEIS public comment period respondents***

| Letter # | Name | Location | Letter type/ #pages [1] | Comments were the same as letter number [2] |
|---|---|---|---|---|
| 1 | Hill, Dan E. | Port Orford, OR | L/1 | |
| 2 | Nielsen, James E. | Coquille, OR | E/5 | |
| 3 | Lufkin, Paul | San Francisco, CA | E/1 | 4 |
| 4 | Kohler, John F. | Daly City, CA | E/1 | |
| 5 | Kellogg, Larry | lkellogg@mcn.org | E/1 | 4 |
| 6 | Durham, Dane J. | Missoula, MT | E/1 | 4 |
| 7 | LaVerne, Tim | Magalia, CA | E/1 | 4 |
| 8 | Vogel, Kristin; Volckmar, Kurt | Garberville, CA | E/1 | 4 |
| 9 | Lewis, Tryphena | Arcata, CA | E/1 | 4 |
| 10 | MacDougall, Caroline | Santa Barbara, CA | E-1 | 4 |
| 11 | Fischer, Doug | fischer@geog.ucsb.e | E/1 | 4 |
| 12 | Cardella, Sylvia | Hydesville, CA | E/1 | 4 |
| 13 | Steitz, Martin | Forest Lake, MN | L/1 | 4 |
| 14 | Anderson, Candy | Sacramento, CA | L/1 | 4 |
| 15 | Ingalls, Libby | San Francisco, CA | L/1 | 4 |
| 16 | Mattson, Kim | Mount Shasta, CA | E/1 | 4 |
| 17 | Christopher, Stephanie | Kentfield, CA | E/1 | 4 |
| 18 | Jim Maurer | Milwaukee, WS | L/1 | 4 |
| 19 | Mildrexler, David | Missoula, MT | L/1 | |
| 20 | Shelton, Lisa | Arcata, CA | L/1 | 4 |
| 21 | Jimerson, Thomas | Eureka, CA | E/6 | |
| 22 | Matteson, Peter | San Francisco, CA | E/1 | 4 |
| 23 | Zoah-Henderson, Zakkary | Eureka, CA | L/1 | 4 |
| 24 | Ragon, Robert E. | Douglas Timber Operators, Inc., Roseburg, OR | L/1 | |
| 25 | Zobel, Donald B. | zobeld@science.oregonstate.edu | E/6 | |
| 26 | Wickham, Steve H. | Plum Creek Timber Co., Coos Bay, OR | E/1 | |
| 27 | Campbell, Bruce | Los Angeles, CA | E/3 | |
| 28 | Partin, Thomas L. | American Forest Resource Council, Portland, OR | L/2 | |
| 29 | Kern, Hugh | Chico, CA | E/3 | |
| 30 | Lipscomb-Kern, Leigh Ann | Chico, CA | E/3 | 29 |
| 31 | Hansen, Everett | Oregon State University, hansene@bcc.orst.edu | E/5 | |
| 32 | Cooper, Lori | Siskiyou Project, Applegate, OR | E/26 | |
| 33 | Jules, Erik; Kauffman, Matt | Humboldt State University, Arcata, CA | E/6 | |
| 34 | Heiken, Doug | Oregon Natural Resources Council, Eugene, OR | E/9 | |
| 35 | Pappalardo, Sue | Arcata, CA | E/1 | 4 |
| 36 | Wroncy, Jan | Eugene, OR | E/2 | |
| 37 | McKay, Tim | Northcoast Environmental Center, Arcata, CA | E/2 | |
| 38 | Eatherington, Francis | Umpqua Watersheds, Roseburg, OR | E/4 | |
| 39 | Vileisis, Ann | Kalmiopsis Audubon Society, Port Orford, OR | E/2 | |
| 40 | Amaroli, Thomas | tomamaroli@yahoo.com | E/1 | |
| 41 | Kennel, Ted | Millbrai, CA | E/1 | |
| 42 | Baker, Kimberly | Klamath Forest Alliance, Orleans, CA | L/1 | |
| 43 | EPIC | Environmental Protection Information Center, El Cerrito, CA | L/27 | 32 |
| 44 | Sjogren, Karen J. | Salem, OR | L/21 | |
| 45 | Tuss, Craig | USFWS, Roseburg, OR | E/3 | |
| 46 | Tyler, Joan | Talent, OR | E/1 | |
| 47 | Board of Commissioners | Douglas County, Roseburg, OR | L/2 | |
| 48 | Connor, Tom | USEPA, Region 10, Seattle, WA | E/2 | |

[1] L = conventional letter; E = e-mail.
[2] Letters 3, 5-18, 20, 22, 23, 30, 35, and 43 were the same as the letter number appearing in this column. The reader should therefore see the comments of the letter shown in this column for the Team's response.

# Public Comments and Agency Responses

Codes in brackets at the end of the Comment paragraph are letter number and (after the - ) comment number in that particular letter. An attempt was made to link specific comments with individual letters; however, the process of combining and editing comments may have resulted in (1) comments being phrased differently than originally presented, and (2) portions of comments being answered elsewhere in this section without a linkage assigned.

## Summary

### Summary

**Comment:** *The summary of effects table states that there are no adverse effects on ESA-listed species. This is inconsistent with the "may affect" determination in the Biological Evaluation, Appendix 7. [44-2]*

**Response:** The wildlife effects section in Chapter 3&4 and the effects summary table have been corrected to reflect the "may effect" determination.

## Chapter 1

### Background

**Comment:** *The Background says the disease is unlikely to kill all trees. Since the disease is almost always fatal, this statement could be misleading. It would be more accurate to say the disease will not affect the range or ecological amplitude. [2-5]*

**Response:** It is unlikely the disease will eliminate POC from large areas. The text has been edited to clarify this point.

**Comment:** *POC is an important ecological component in many watersheds where its ability to survive on poor soils often results in this species being the only large structural component on the landscape. [4-5, 37-4]*

**Response:** This is an important point and contributes significantly to the ecological value of POC. This value is mentioned early in the Background section of the SEIS, and discussed in some detail in the Ecology and in the Water and Fisheries sections in Chapter 3&4.

**Comment:** *The SEIS does not disclose that failure to prevent the spread of PL will violate the Northwest Forest Plan Aquatic Conservation Strategy and its 9 ACS objectives. The difference between Alternatives 2 and 3 (and an even more conservative alternative) is the difference between maintaining aquatic habitat (Alt. 3 or better) or degrading, retarding or preventing attainment in violation of the ACS (Alt. 2). Loss of POC will cause loss of shade and bank stability, and, over the long term, loss of large wood recruitment, which will cause aquatic degradation. [34-19, 32-68, 43-80, 32-3]*

**Response:** Discussion of the importance of POC to stream function begins in the Background section with ". . . it often grows within the active stream channel, where, as large, old trees, it provides shade and long-lasting stream structure . . . " and ". . . important for contributing shade and coarse wood in certain stream systems." This function is incorporated into the Issues identified in Chapter 1 as ". . . how are the aquatic and terrestrial ecosystems affected by the loss of POC." Specific details about these roles and how the loss of POC might affect streams are included in the Water and Fisheries section in Chapter 3&4. A discussion of the consistency with Aquatic Conservation Strategy has been added to the Water and Fisheries section in Chapter 3&4.

**Comment:** *The NWFP requires management of POC ecosystems. LSR direction requires protection and enhancement of late-successional and old-growth forest ecosystems and protect them from loss from disease epidemics and major human impacts (NWFP pg. B-1). [32-3]*

**Response:** The Need for the maintenance of POC as an ecologically significant species includes maintaining the role POC plays in the functionality of late-successional ecosystems. Several of the alternatives, including the proposed action, would provide even greater protection of these environments when compared to current management practices.

**Comment:** *The draft SEIS states that in the Kern case, the 9th Circuit said that the Agencies were "vigorously" exercising management direction to limit the spread of the disease. A thorough reading of Kern does not support such a statement. Nowhere in Kern does the Court express any opinion about the adequacy of the BLM's implementation of management direction to limit the spread of PL. [32-17]*

**Response:** The SEIS wording mistakenly gave this impression and has been rewritten.

**Comment:** *The SEIS explains how timber hauling and other public uses on commingled private and public lands make many techniques to reduce disease spread ineffective or not cost effective. This should be dealt with by having the Oregon Department of Forestry as a cooperating agency. One outcome of having the ODF participate would be formal recommendations to amend the Oregon Forest Practices Act. Amendments to the Oregon Forest Practices Act could greatly reduce the risk of spread on private lands, especially those located upslope or upstream of Federal lands. Such cooperation is directed by the NWFP, and is part of the court's mandate to consider ". . . cumulative effects to the health of POC over its entire range in light of the reasonably foreseeable actions of the Agencies and others." The inclusion of state agencies as cooperators would broaden the Purpose to include maintaining POC on all lands; a strategy that includes only public lands is not scientifically credible or adequate because the disease is readily transported across property lines via vehicles or stream flows. [32-63]*

**Response:** Under Council on Environmental Quality regulations, a state agency may by agreement with the lead agency become a cooperating agency (40 CFR 1508.5). Thus, it is not simply the choice of the lead agency, as it is under 40 CFR 1501.6 where there is a Federal agency ". . . which has jurisdiction by law." The Agencies do not have the jurisdiction to require the state governments to cooperate in any effort that may be undertaken by Federal agencies to reduce the rate of the spread of this disease.

State forestry personnel were included in scoping and early SEIS design. It was clear that the state and private approach to PL is likely to remain substantially different from that on

Federal lands. The state Agencies typically do not try to impose their management approach on private lands.

Preparing a scientifically valid cumulative impact analysis, however, does not depend on having the states as cooperating agencies. The analysis has considered the reasonably foreseeable actions on state and private lands. While efforts to slow the spread of the root disease would no doubt be more effective if all timber landowners participated, previous efforts and responses to the SEIS indicate that is not likely to happen at any significant scale. The effects predicted in the SEIS are based on the assumption that other landowners will continue their current management practices to control the disease. To the extent they do, the impacts would likely be less than what are predicted. The analysis shows that the Federal agencies can influence the rate of infestation regardless of what other owners choose to do.

**Comment:** *This document presents a very limited historical perspective on the effort to combat root disease. There is no mention of the important contributions that various individuals and environmental groups made to the Forest Service and later to the BLM programs. There is no mention that Lew Roth started the whole process of disease management including the resistance program, working first with Coos County Forest and then with the Powers District, Forest Service. There is no mention of a researcher named Trione who did some early work. There is no acknowledgement of the importance of environmental organizations in pushing the Forest Service to organized action in 1987 and 1988 and again in 1995. And there is nothing included in the History section about the 1985 letter to the Agencies from the Eugene Law Clinic and the formation of the Consensus Group in 1986. These were important events in the development of a POC management strategy. The Consensus Group developed a prototype PL control strategy for a timber sale. These omissions are more than just historical carelessness. They reinforce a "go it alone" image that is counter to the need for public involvement and cooperation if the POC program is to succeed. [31-3, 2-7, 2-8]*

**Response:** The objective of the Background section in Chapter 1 is to sufficiently set the stage to define the Purpose and Need sections and not to provide extensive historical detail. In the SEIS, the Background section in Chapter 2 was also intentionally limited, in this case to provide enough background about the origin of the current direction to provide context and possible sideboards for the alternatives. However, in response to these comments and in the interest of better presenting the historical setting, additional discussion has been added to Chapter 2 about the history of Federal POC management.

## The Need/The Purpose

**Comment:** *The described "need" is to maintain POC as an "ecologically and economically significant" species on BLM and FS lands. These terms are undefined, and there is no explanation of how they will be met by the alternatives. [21-17]*

**Response:** The various discussions of affected environment in the SEIS, in total, are intended to describe the ecological and economic role POC plays in the southwest Oregon (and to some degree, the northwest California) landscape, and how POC's contribution to that role would be expected to change under each alternative. It will be up to the decision-makers to evaluate the significance of that role, and select an alternative that appropriately maintains POC.

**Comment:** *The Purpose and Need should be for POC to fulfill all of its functional roles in ecosystems throughout its historic range, both now and in the future. [32-2, 43-73]*

**Response:** That is essentially what the Need statement describes.

**Comment:** *Under the Need, the Agencies also have an opportunity to mitigate PL losses by planting POC on sites not currently occupied by POC. [2-6]*

**Response:** This opportunity has been added to the Need statement.

**Comment:** *The goal of management and/or the purpose and need for the SEIS must be to prevent, not just reduce, the spread of PL and its introduction into uninfested areas. Prevention of spread and introduction is the appropriate goal in congressional designations including but not limited to Wilderness, National Recreation Areas and Wild & Scenic Rivers and land allocations such as Late-Successional Reserves, Riparian Reserves, Botanical Areas and Research Natural Areas. [32-76(S), 25-14, 40-2, 39-1, 38-15(S), 34-15, 32-78(S), 43-80(S)]*

**Response:** The Agencies would very much like to "prevent" PL from entering many of the areas described, but there are semantic, access, and cost-effectiveness issues with using the word "prevent." To many readers "prevent" means the Agencies will do whatever it takes to block new infestations. Unfortunately, every entry into the forest creates some risk of spreading PL. Without closing the forest, managing PL becomes an issue of risk management. Instead of agreeing to "prevent" infections up front, the SEIS looks at alternatives to variously reduce long-term spread, and weighs the costs of those alternatives against the ecological and other benefits of each.

**Comment:** *The statement that the root disease seems destined to spread over the entire range sets up a minimalist proposed action reflected in the proposed action and other alternatives. [32-1]*

**Response:** The statement is made in the recognition that PL is transported by animals, hikers, and other vectors unlikely to be controlled by the Agencies. However, discussions of the ecological value of the large POC remaining, mostly on public lands, have been strengthened. The proposed action has been expanded to place more emphasis on uninfested watersheds, and an additional alternative has been added that provides more protection for uninfested 7th field watersheds. The Agencies have no preconceived position of a "minimalist" approach, but are using the SEIS process to take a hard look at the risks, the ecological values at stake, and the relative costs for each of the alternatives.

**Comment:** *The Need should not be just to "maintain" Port Orford cedar as a species in the ecosystem but to maintain Port Orford cedar's genetic diversity and ecosystem function throughout its native range. A Port Orford cedar seedling, albeit important, cannot perform the same function or ecosystem services as a 200-year old cedar growing on a floodplain or streambank. [32-76(S)]*

**Response:** Maintenance of genetic diversity and ecosystem function are part of the Need to maintain POC as an ecologically significant species. The effects sections describe the values that would be lost if larger trees are killed by PL.

**Comment:** *The draft SEIS states that the Need for this proposed action was not created by any previous management action. While it is true that the Agencies did not create PL itself and were not responsible for its initial introduction, the draft SEIS should have disclosed the Agencies' complicity in the spread of the disease. Agencies' management activities plus a resistance to closing roads and strictly enforcing off-highway vehicle activity and special forest product gathering (particularly POC boughs), despite countless letters and conversations from conservation organizations and concerned scientists, has lead to what the draft SEIS refers to as the "inevitable" spread of PL and a downplaying of the seriousness of the current situation. [32-15]*

**Response:** This discussion has been edited to acknowledge the contribution of management activities and past Agency policies to the current status of the disease.

**Comment:** *Under the Purpose section, the draft SEIS argues that the current management protocols have not been found illegal by the courts, and therefore ". . . meeting the Need does not necessarily require a change in the current management direction. Arguably, all that is missing from the current direction is a determination of the range-wide environmental effects of that direction." The draft SEIS could have just as easily said that perhaps the current management protocols are inadequate and this draft SEIS will evaluate the need to strengthen protections for POC. But instead, the draft SEIS chose to bias the selection process to the current protocol. [38-11]*

**Response:** The cited paragraph notes that the SEIS analyzes a range of alternatives that would meet the Need, that the No-Action Alternative is expected to meet the Need, and that other alternatives provide either higher, lower, or different kinds of protection and mitigation measures than the No-Action Alternative. The point is that a range of alternatives including the No-Action Alternative are examined in the SEIS, and the deciding officials will weigh each alternative against the Purpose and Issues to make their selection. No bias toward any particular alternative is stated or assumed. On the contrary, to have assumed the current management was inadequate would have biased the selection process away from an alternative that may, pending evaluation of the analysis by the decision-makers, meet the Need.

**Comment:** *The Purpose section should include maintenance of POC as an important element of biodiversity, as called for in the National Forest Management Act. [21-2, 43-80(S)]*

**Response:** The Need for maintenance of POC as an ecologically significant species includes having it contribute to its role in biodiversity. The Purpose section has been edited to note that the selected alternative must meet legal requirements.

**Comment:** *The Purpose section of the SEIS should be expanded to answer the following questions:*

*1) What is the extent of POC on Federal lands and how much is infected?*
*2) Which plant communities are represented and what is their extent?*
*3) What is the allocation of POC by land management classification (congressional withdrawal, administrative withdrawal, late seral reserve)?*
*4) What is the risk of POC root disease being introduced into these plant communities?*

*5) Are administrative units of the BLM and FS operating under the same management direction?*
*6) Are the management directions being followed on each unit?*
*7) How effective is the management direction?*
*8) Is the lack of accurate maps of POC in Oregon affecting the ability to manage POC and the root disease? [21-8]*

**Response:** The purpose of the SEIS is not to provide various POC data, but to identify and evaluate alternatives that will maintain POC as an ecologically and economically significant species on BLM and NF lands. To the degree answers to the above questions are needed for the analysis, they are included in the analysis, or the implications of not having the information are discussed. To some degree, answers to each of the above questions are included in the analysis. For example (but not limited to):

1) GIS and CVS inventories of POC and PL are discussed in the Port-Orford-cedar Acreage Data section in Chapter 3&4 and carried into the disease projections table in the Pathology section. Map 3 shows Agency GIS mapping of all POC and PL infestations. The mapping techniques and potential accuracy issues are discussed in the Acreage Data section and noted in the Incomplete and Unavailable Information section.

2) Plant community information is summarized in the Ecology section and used in the Water and Fisheries and other sections to help quantify potential effects. Specific PL risk is not evaluated by plant association because the average PL spread predictions apply equally within the accuracy of this programmatic analysis.

3) POC by NWFP land allocation is shown in the NWFP discussion early in Chapter 3&4.

4) The predicted 100-year spread rate for the various alternatives translates to a general risk prediction. In Alternatives 2, 3, and 6, for example, the Agencies have an opportunity to create risk above or below that average depending upon the significance of the POC in the particular case. A plant community-specific evaluation of risk is not necessary within the SEIS to design an effective PL-reducing strategy.

5) The descriptions in Chapter 1 and Appendix 3 makes it clear that the units, other than the three BLM districts, are not operating under the same strategy. Appendix 2 makes it equally clear the Agencies have been operating similarly, and coordinating and sharing resources and knowledge. More consistent direction across units is one reason the Siskiyou NF joined the BLM in this SEIS effort.

6) Annual implementation monitoring on each unit indicates a high compliance with land and resource management plan Standards and Guidelines.

7) The effectiveness of the various elements of management direction are described in the Pathology section, are the subject of continued monitoring as described in Appendix 5, and are discussed in the Incomplete and Unavailable Information section of Chapter 3&4.

8) This is a subjective question. The Agencies are continually remapping POC and PL to

improve management. For example, BLM and FS are ground-truthing POC mapping of the Biscuit Fire within 100 yards of roads, and have an active contract to remap the 75 percent of the Biscuit Fire with post-fire aerial photos. The current information is adequate for the design and evaluation of the programmatic alternatives in the SEIS. This point is discussed in Alternatives Eliminated from Detailed Study, and under Incomplete and Unavailable Information.

**Comment:** *Retention of large, old POC, as well as those on serpentine soil where they are critical to providing canopy, should be part of the Need section. [44-4]*

**Response:** The importance of the ecological role POC plays on serpentine (ultramafic) soils is part of the ecological significance intended by the Need section, and is well described in several Affected Environment sections of the SEIS.

**Comment:** *Despite the draft SEIS' expansion of the Need to include ". . . providing access to POC products . . . avoiding unnecessary restrictions to public access and use . . . " and ". . . providing for continued extraction of a wide range of products . . . " it is appropriate for this Agency action to fulfill these secondary "purposes" only as side-effects to fulfilling the "primary underlying need" to which the POC draft SEIS responds, which is maintenance of POC as an ecologically and economically significant species on Federal lands. The Forest Service and BLM cannot avoid this "underlying need," because the NWFP, the National Forest Management Act, the Federal Land Policy and Management Act, and the Forest Service Organic Act also mandate that the Agencies protect Port Orford cedar. The multiple-use mandates should not be presented as absolutes, as taking precedence over the need to maintain POC as an ecological and economically significant species on BLM and FS lands. These mandates need to be treated with the flexibility intended them, if the need to maintain POC is to be met. The open-ended inquiry required by NEPA should not be constrained by the need to continue POC harvest or for that matter widespread timber harvest. Alternatives should be modified to meet this need, and alternatives eliminated from detailed analysis for these reasons should be analyzed. [21-9, 32-10, 34-2, 34-1, 32-38, 32-39, 32-1]*

**Response:** The Purpose section has been edited to show more flexibility in balancing other multiple-use goals with the Need for maintenance of POC. Alternatives considered but eliminated from detailed study have been reconsidered, and elements of those alternatives brought into existing alternatives as appropriate. The record of decision will examine compliance with appropriate laws as it weighs the balance between meeting species conservation needs and other applicable laws and objectives.

**Comment:** *With respect to the Purpose, restricting public access is not necessarily a "cost" since this helps prevent forest fires caused by arson or carelessness, and reduces vandalism, trash and the cost of administering public lands. [44-5]*

**Response:** Restricting access has these and other benefits, but also reduces opportunities for certain kinds of forest uses, including recreational and extractive. It can also make wildland fire operations more difficult. The relative values of roads and other means of access are considered during road management planning, and are outside the scope of this analysis.

**Comment:** *The "issue" list should include mineral entry as an activity considered for restriction, especially since the text discusses it. [44-6]*

**Response:** The list of management practices that may spread the disease has been expanded to include livestock grazing and mining. However, even management activities not on the list my be affected by the Standards and Guidelines of the selected alternative.

**Comment:** *"Maintenance" and "Restoration" are not defined. If mature POC are to be maintained and the ecosystem is to be restored to include mature POC, then it is not clear that any alternatives will meet this need without termination of logging and other management operations wherever POC are present. [29-6]*

**Response:** *Maintenance* and *restoration* have been added to the Glossary. However, the determination of whether POC has been sufficiently "maintained" or whether POC functionality can be "restored" are determinations to be made in the record of decision based on the analysis in the final SEIS. POC will have been maintained if its ecological role is sufficiently maintained. Although the SEIS Team attempted only to include alternatives it thought would meet this need, it will be the decision-makers' evaluation of the SEIS analysis that will determine if the selected alternative meets that test.

A planting assumption has been added to the Assumptions section in Chapter 3&4 to explain expectations for planting levels, priorities, and expected growth rates, to provide a basis for restoration expectations within resource sections in Chapter 3&4.

**Comment:** *Regulations promulgated pursuant to NFMA also mandate that the Forest Service provide for protection of POC:*

- *36 CFR 219.26 requires the Forest Service to ". . . provide for diversity of . . . tree species consistent with the overall multiple use objectives of the planning area."*
- *36 CFR 219.27(c)(7) prohibits silvicultural treatments " . . . where such treatments would make stands susceptible to pest-caused damage levels inconsistent with management objectives."*
- *36 CFR 219.27(g) states that management prescriptions ". . . shall preserve and enhance the diversity of plant and animal communities . . . so that it is at least as great as that which would be expected in a natural forest and the diversity of tree species similar to that existing in the planning area."*

*The draft SEIS should have disclosed the Forest Service's obligations to protect diversity pursuant to NFMA and its implementing regulations. The proposed action does not satisfy these obligations. [32-6]*

**Response:** The stated Need for maintenance of POC as an ecologically and economically significant species on BLM and NF lands encompasses these requirements. A need for the decision to meet all applicable laws is understood. A complete listing of such laws would be too voluminous to include in the Need statement. The record of decision will make a finding of consistency with applicable laws.

**Comment:** *Alternative 3 will clearly cause PL to spread less than other alternatives, and will still allow the Agencies to fulfill their other management objectives. Therefore by not selecting Alternative 3, the Agencies will be taking an action that violates FLPMA and NFMA:*

> *In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands . . . [FLPMA]*
>
> *. . . destructive insects and disease organisms do not increase to potentially damaging levels following management activities. [NFMA]*

*[29-3]*

**Response:** The selected alternative must meet all legal requirements. The analysis helps establish "necessary" and "damaging levels." The decision-makers will address how the selected alternative meets these requirements.

## Issues

**Comment:** *Continued harvest of POC to feed Japan's demand for culturally significant products should have been included as an Issue. This is certainly a greater demand than tribal uses and affects the economic viability of POC, biasing the SEIS toward continued commodity production. Meeting this "need" could influence the continuation of the otherwise useless "roadside sanitation" mitigation that provides a source of POC to overseas markets. [38-12]*

**Response:** The economic and product benefits derived from POC harvesting are factors to be considered in a management strategy. In recent years, however, Japanese demand for POC has dramatically decreased. Production of products is not a decision factor in whether or not to do sanitation treatments, but the ability to sell resultant products can affect Agency costs for the treatment, which is a consideration in evaluating various mitigation treatment options.

**Comment:** *The main problem with the spread of PL is roads. Jules found that vehicles along roads caused 72 percent of POC infections. He found POC populations in creeks crossed by roads were more likely to be infected. [38-17]*

**Response:** The connection between PL spread and roads as documented by Jules and others is acknowledged in the Pathology section and elsewhere.

**Comment:** *The Agencies current management of POC does not reflect the current knowledge about POC and PL. Of particular concern is the loss of older POC which are irreplaceable, the impacts of their loss on the important and often unique ecosystems they inhabit, and the effect on associated species. Other concerns include the loss of biodiversity within the native range of POC, the impacts to associated species such as native, naturally reproducing salmon and steelhead or rare plants, the loss of the ecosystem functions/benefits preformed by POC as they are lost or their ecological role diminished in sensitive habitats, and the diminished aesthetics from the loss of beautiful old cedar. [32-73]*

**Response:** All of these concerns are addressed in relevant sections of the SEIS.

**Comment:** *The scoping notice identified an issue as ". . . should forest uses be restricted to prevent the spread of the disease." The issue as written is too broad-brushed and a red herring that will only serve to stir up public opposition to POC disease control measures. [32-79]*

**Response:** Numerous commenters expressed substantial doubt over the effectiveness of sanitation, gates, and other mitigation measures, and insisted closing roads was the most important treatment. The Pathology section gives high marks to road closing as a way to control PL spread. Some of the alternatives include requirements to close non-system discretionary roads in POC stands. Similarly, some specific forest uses were identified in the SEIS and by the public as significant PL spread vectors. PL bough collection and certain off-highway vehicle use are a couple of examples. Restricting some current forest uses is being considered, and is clearly an issue. The balance between those restrictions and the predicted benefits of such restrictions (among other things), in terms of reduction in PL spread rates and resultant maintenance of ecological and other values, is at the heart of the decision of which alternative to select.

### Scoping

There were no substantive comments.

## Chapter 2

### Background, The Supplemental Environmental Impact Statement, Endangered Species Consultation, The Planning Area, and Relationship of Alternatives to Existing Management Plans

**Comment:** *The draft SEIS states ". . . none of the EIS alternatives would result in a significant change to the Siskiyou forest plan." For POC to be managed as an ecologically and economically significant species as identified in the Need, all Federal management units will require significant changes to the management of their lands. Timber harvest, special forest products, off-highway vehicle use, access, and recreation activities to name a few, will need significant modifications to meet the POC Need and carry out the legal mandates of the FS and BLM. [21-21]*

**Response:** As noted in the SEIS, *significance* in the NFMA planning regulations sense is different from NEPA significance. The NFMA question of significance is designed to determine if the proposed change is so great as to require a complete restart of the Forest land and resource management plan. The SEIS concludes this is not the case. The SEIS does not deny the issues considered and the changes proposed could be significant in a NEPA sense; that is one reason an EIS has been prepared.

**Comment:** *Root disease is not the only pressure on POC populations. Historically, it seems clear that timber harvest and regeneration practices have caused an overall reduction in POC, especially mature POC. The SEIS seems to rely heavily on the large proportion of Federal POC that grows in areas with more or less protection from harvest resulting from the NWFP. [31-6]*

**Response:** The historical loss of old-growth POC across the landscape has been added to the discussion in the Port-Orford-Cedar Background section in Chapter 3&4. Many sections of the SEIS reflect a higher level of protection of POC on Federal lands where timber harvesting is not the primary land use objective.

## The Alternatives

**Comment:** *None of the alternatives meet the Purpose and Need sections because the planning area does not include California. If this is allowed to remain, forest management in Oregon could have detrimental effects throughout POC groves within Six Rivers, Shasta-Trinity, and Klamath National Forest watersheds in California. [32-12, 4-1, 37-1, 20-8, 34-24, 21-15, 43-74(S), 11-8]*

**Response:** The action area is limited to the Federal lands in Oregon because those were the units whose land and resource management plan direction was the oldest, most incomplete, and/or whose direction the court found inadequate. The land and resource management plans for the California NFs are more recent, about 1995, and contain substantially more POC management direction.

The court did not suggest that California needed to be part of the proposed action, only that cumulative effects of the alternatives be analyzed at the appropriate scale. In this case, the action alternatives would only affect the Oregon administrative units, and to the degree that the effects of those alternatives may affect California, those effects have been displayed. For the purpose of the analysis, the existing land and resource management plan direction for the California administrative units was assumed to apply regardless of which alternative is selected for Oregon.

**Comment:** *One or more alternatives should include land exchanges as a tool for protecting existing POC. Land exchanges could consolidate Federal ownership, making road closures and other access control measures more effective. [25-12]*

**Response:** The new Alternative 6, similar to Alternative 3, but based on 7th rather than 6th field watersheds, includes a requirement to consider land exchanges to block-up these uninfested watersheds and obtain control of access routes, especially on serpentine-affected soils.

**Comment:** *The SEIS should consider a rule-making process to establish reserved areas to preserve POC, its habitat, and the genetic diversity of the species. [32-82(S)]*

**Response:** Whatever management direction is selected can be applied without rule-making.

**Comment:** *The Agencies should put more emphasis on preventing the spread of the disease to healthy trees. Even if the resistance breeding works, it won't adequately replace the ecological function for many years if ever. [38-2]*

**Response:** The tone or balance of the SEIS has been changed to better recognize the importance of existing POC, and more descriptively define the timing, limitations, and risks associated with the resistance breeding program.

**Comment:** *The accelerated breeding program described in Alternative 4 should be added to Alternative 2 or 3 to produce seed for all breeding zones within 10 years, and because of its potential importance in providing seed to private timberland owners. [44-19, 2-26]*

**Response:** The SEIS has been edited to further illustrate the effects and implications of the accelerated breeding program. A planting assumption has been added that describes the assumed planting and growth rates; those assumptions have been better referenced in the resource effects section, and the cost section has been edited to show the benefits of accelerating in terms of reducing costs in future decades. While these discussions are part of Alternative 4, they are identifiable enough that the decision-makers can assess the benefits of adding this feature to any other alternative at the time of the record of decision.

**Comment:** *The draft SEIS does not adequately protect POC across the planning area. There should be new alternatives that provide much more conservative protocols for assessing projects that may put POC at risk, and more effective and comprehensive mitigation efforts for when projects do go forward beyond the planning stage. The assessment protocols must be clearly defined and must set an upper level of risk that beyond which a project would not go forward. Mitigation strategies should focus on those that are proven to work, rather than on unproven techniques. The strategies that are clearly best include permanent and seasonal road closures, as well as stronger protection of currently roadless areas. [33-21]*

**Response:** A new alternative has been added to the SEIS that adds the features of Alternative 3 to 162 uninfested 7th field watersheds. In Alternative 2, these same watersheds have been linked to the risk key to provide equal protection as other areas essential to meeting land and resource management plan objectives. The options of not going forward with the project, and not building roads, have been added to and below the risk key, respectively. The value of road closures over other mitigation measures is recognized and described in the Pathology section. The complete set of all known possible PL control and mitigation measures is included in Alternatives 2, 3, and 6 either above or below the risk key. The relative value of each of these measures is described, referenced, or alluded to in the Pathology section; project designers can access that information when deciding what measures to select to satisfy the risk key. The need to apply ". . . one to several . . . " of the Management Practices, and ". . . the one or combination of specific practices best fitting the nature of the risk and the site-specific conditions . . . " is clarified below the risk key. One or more of the alternatives in the SEIS appear to fully meet the Need statement and applicable laws; the SEIS provides a rigorous examination of all reasonable alternatives appropriate to the programmatic scale.

**Comment:** *No alternative meets the NWFP's Aquatic Conservation Strategy (ACS) Objectives 1, 4, 5, 6, 8, and 9 because they do not protect Riparian Reserves from the degrading effects of PL. Specifically the Restoration requirement in Alternative 2 is inadequate because it does not provide a timetable or prioritization scheme for restoration of areas already affected; no alternative adequately implements NWFP RF-3c (page C-32 of NWFP ROD S & Gs), which calls for the closing or obliteration of roads based on the ongoing and potential effect to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs; and, no alternative addresses the need to restrict or regulate mining access in riparian reserves which contain POC. Specifically, Standard and Guideline MM-1 is not being implemented by the Siskiyou National Forest. Miners are accessing riparian reserves with motorized vehicles and equipment without restrictions designed to reduce introduction of PL. [32-68]*

**Response:** Not unlike watershed analysis, the SEIS analysis examined the potential effects of the loss of POC under the various alternatives in the context of current watershed and fisheries conditions, and described those effects so decision-makers can determine if either the Aquatic Conservation Strategy would be met or the analysis and selected alternative provides the opportunity and information to make that determination at the project scale. Each alternative except Alternative 4 provides PL control or mitigation measures that will, among other objectives, help meet the Aquatic Conservation Strategy.

Generally, restoration needs would be determined at the site-specific scale. The newly added planting assumption describes assumed reforestation and stand-tending levels, and assumed growth rates of planted stock. It is anticipated that highest priority for placement of this stock are those areas impacted most by POC mortality, particularly those areas harboring listed species. The value of road closing is well described and would be implemented as needed to meet site-specific needs. Mining activities are generally permitted or trends are known, and application of the risk key can help identify appropriate Management Practices to apply. In any event, the suggestion to focus education and outreach efforts for ". . . user groups most likely to engage in activities at more risk for spreading PL . . . " is a requirement of Alternatives 2, 3, and 6 above the risk key.

**Comment:** *The draft SEIS does not disclose or address the impacts of mining and mining access roads in POC areas. The issue is not whether mining is allowed but how best to minimize surface damage from PL introduction. Suction dredge mining is widespread in the range of POC. Miners have constructed and/or use many 4 wheel drive or ORV roads. Some of these roads do not appear on transportation maps. In addition miners have been known to construct or reconstruct roads and trails through uninfested POC stands along creeks. The number and distribution of high-risk sites is underestimated because mapping does not include mining access roads. [32-67]*

**Response:** A mining effects section has been added to Chapters 3&4. The Pathology section also addresses the contribution of ongoing mining activities to the spread of PL, projected over 100 years. The SEIS notes that a mining road has been implicated in a long-distance spread to the interior of the Kalmiopsis Wilderness. The nature of mining and potential permitting and other conditions applicable to mining is discussed in the Alternatives Considered but Eliminated From Detailed Study section of Chapter 2. Agency actions related to mining are subject to assessment through the risk key described for Alternatives 2, 3, and 6. The concern with roads and the value of closing them, particularly in the high-risk areas where much mining takes place, is well discussed in the SEIS. The Community Outreach provision of Alternatives 2, 3, and 6 includes the suggestion to focus education and outreach efforts for ". . . user groups most likely to engage in activities at more risk for spreading PL."

**Comment:** *The draft SEIS does not provide for the implementation of NWFP Standard and Guideline GM-1 on a regional basis. Current livestock grazing is likely to increase the spread of PL. The draft SEIS provides no regional guidance to prevent the spread of PL from livestock grazing (e.g., review of existing Allotment Management Plans). [32-68]*

**Response:** As noted in the Pathology section, livestock (as well as elk) are implicated in PL spread. Reissuance of livestock grazing permits has been added as an example of an activity requiring application of the risk key under Alternatives 2, 3, and 6. A grazing effects section has been added to Chapter 3&4.

**Comment:** *It would be useful to have some more protective options in place so if the underlying assumptions about level of forest use or spread of the disease are discovered to be* *incorrect, managers can have the option of picking more protective measures or alternatives. [39-6]*

**Response:** The monitoring plan for the Action Alternatives includes a requirement to regularly evaluate ongoing mapping and inventories to determine if disease spread departs significantly from the predictions made in this SEIS. If such a departure indicates the need for a different management strategy, alternative strategies would probably be examined under a new NEPA process as part of a regular land and resource management plan planning cycle. It would not be practical to identify the "fix," without seeing what is "incorrect." Displaying the environmental effects of such a fix would necessarily be based on wholly speculative projections, and therefore useless to a rational decision-maker.

**Comment:** *The range of alternatives is too narrow and fails to include a highly conservative alternative that would aggressively protect a larger fraction of the uninfected POC along streams and other wet areas, in ultramafic areas, in old-growth, where rare and sensitive species live, and so forth. [34-1]*

**Response:** Alternative 6 has been added, in part, to address this issue. Also, the risk key of Alternative 2 has been revised to highlight the importance of the 48,000 acres of POC in uninfested 7th field watersheds, changing the proposed action to be more conservative as well.

## Alternative 1

**Comment:** *Since the court is requiring NEPA analysis for the original BLM resource management plan direction, it is incorrect to call continuation of that RMP direction the "no action" alternative. The draft SEIS does not have a "no action" alternative as required by CEQ regulations. [29-1]*

**Response:** The court did not vacate the 1995 Coos Bay resource management plan decision regarding POC direction, and it did not address the Roseburg, Medford, or Siskiyou plans at all. The existing direction is correctly identified as the No-Action Alternative. Even so, this identification has little material effect on the analysis in this SEIS. If this were the construction of a dam or similar project, the No-Action Alternative would serve as a baseline from which to measure and describe environmental effects. In the POC SEIS, only direct effects like jobs, special forest products, and timber harvest are described from the No-Action Alternative baseline. Indirect effects, those resulting from the various levels of POC mortality, are described from a baseline of current infestation level, with adverse effects variously described for all alternatives without regard for whether those effects are less than or more than what would be expected under the No-Action Alternative. For these effects, Alternative 5 might arguably be presented as the "no action" alternative, with all other alternatives variously reducing PL spread and related indirect environmental effects when compared to an Alternative 5 baseline.

**Comment:** *For baseline purposes, the draft SEIS proposed the No Action Alternative, Alternative 1, which is the current management approach. [48-1]*

**Response:** Although Alternative 1 is the No-Action Alternative, Chapter 1 notes that this appears to be a selectable alternative, and nothing in the court decision leading to the FSEIS implies the current strategy is not adequate. It is not just included ". . . for baseline purposes."

**Comment:** *The current direction for the Forest Service is defined only by example, and reference to the Siskiyou Management Plan, which refers to the POC Action Plan, which has been formally declared to be ceasing to be operative. This seems to be extraordinarily weak documentation of existing POC policy. [31-12]*

**Response:** Other than the emphasis inferred from the citations in the land and resource managment plan, many of the current PL management practices being implemented on the Siskiyou NF are "routine business" or otherwise incorporated into various management practices, without a specific direction document specific to POC. However, additional emphasis on POC and control of PL was added to the management strategies for the Siskiyou NF with the release of "Interim Direction for Best Management Practices (BMPs) for Noxious Weed Prevention and Management, Port-Orford-cedar Root Diseases Prevention and Management, and Sudden Oak Death Prevention and Management" on February 15, 2002. The best management practices highlighted the need for environmental analysis of the potential effects of management actions on POC and PL. Direction focused on roads but also included review of all projects within the natural range of POC, and the use of Clorox bleach. This explanation has been added to the description of the current Siskiyou NF direction in Alternative 1, within Chapter 2.

## Alternative 2

**Comment:** *The stated objective for Alternative 2 of "maintain[ing] POC on sites where the risk for infection is low" is too limited. The Agencies should aim to protect native POC on sites with low <u>and moderate</u> risk of infection. [25-7]*

**Response:** The objective statements for all of the alternatives have been revised to better describe the intent of the alternatives. For Alternative 2, additional wording includes reducing the spread "and severity" of root disease ". . . in high-risk areas to retain its ecological function to the extent practicable."

**Comment:** *Alternative 2 does not meet the Need for the maintenance of POC as an ecologically and economically significant species because it would actually lead to further loss of POC due to infection with PL. [32-10]*

**Response:** All alternatives, and any others that could be designed, would lead to further loss of POC due to infection with PL. It is up to the analysis to show whether, and which, alternatives meet the Need. Prevention of any further loss of POC to PL infection is not the Need, and it would serve no useful purpose to set such an impossible objective as the Purpose of the action.

**Comment:** *Alternative 2 would provide nominal prevention from infestation compared to the current management direction. The estimated area of infestation in 100 years is 35 percent of the acres where POC is prominent under Alternative 1, dropping only to 33 percent in Alternative 2. [48-2]*

**Response:** There were errors in the SEIS for some of the numbers in the Ecology section, and those tables have been reworked. The percentage differences between alternatives where POC is prominent are now proportionate, and similar, to the percentage differences for the 100-year PL spread predictions from which they are derived. With revisions because of changes to the preferred alternative, the predicted infestation percentage at 100 years is 21 percent for Alternative 1, 19 percent for Alternative 2, and 17 percent for Alternative 3.

**Comment:** *Alternative 2 does not provide additional protection for uninfested areas from PL. These areas can act as a refugia of diversity and abundance of an unimpaired POC ecosystem. [48-3]*

**Response:** Alternative 2, the preferred alternative, has been revised to include identification of, and emphasis on, the 162 currently uninfested 7th field watersheds.

**Comment:** *The strategy should develop options to curtail or modify mining activities, logging practices, livestock grazing, off-highway vehicles, other recreation, and wildland fire operations policies to prevent or limit spread of infestation. These policies should also be implemented with Standards and Guidelines that cannot be exempted at the discretion of the Forest Supervisor. For example, on the Biscuit Fire in 2002, Six Rivers National Forest, Port Orford cedar policies for preventing the spread of the root disease were suspended during fire suppression activities by the Forest Supervisor. [43-86(S)]*

**Response:** Alternatives 1, 2, 3, and 6 all contain provisions that would curtail or modify mining activities, logging practices, livestock grazing, off-highway vehicles, other recreation, and wildland fire operations as needed to prevent or limit spread of PL infection. For Alternatives 2, 3, and 6, these practices are implemented according to values and risks identified through the risk key.

For Alternatives 2, 3, and 6, the Standards and Guidelines place a high emphasis on PL control, particularly in all fire preparedness planning and also during suppression activities to the extent practicable. Extensive use of vehicle washing, Clorox bleach use, and using water from identified disease-free sources are examples described in the Fire and Fuels section of Chapter 3&4. However, these practices may be curtailed when safety and property protection issues arise. This potential is described in the alternatives and considered in the calculations of 100-year PL spread.

**Comment:** *The strategy should permanently close infested campgrounds such as the Fish Lake Campground located on the Orleans Ranger District, Six Rivers NF, to prevent infections from getting into adjacent high-risk uninfested areas with high biological value such as the Blue Creek Watershed. [43-85(S)]*

**Response:** The current direction, Alternative 1, has resulted in closing Fish Lake Campground in Region 5 for conducting eradication treatments; the campgroud will be closed until baiting indicates PL is gone from the soil. The risk key and related direction in Alternatives 2, 3, and 6 would lead to similar actions in Oregon when warranted by similar conditions.

**Comment:** *The proposed action should include requiring a control strategy be developed for each activity such as a timber sale, as has been done on the Siskiyou NF in the past. You should add a requirement for 5 to 15,000 acre (watershed scale) PL control plans that* *consider all resource activities. [2-12, 2-22, 2-25]*

**Response:** Working within the direction provided in the selected alternative from this SEIS, the determination of appropriate management of POC root disease at the "activity" scale would be documented in NEPA documents or similar planning record for the activity. The result should achieve most or all of the potential benefits that would be achieved from a mid-level control strategy.

**Comment:** *The selected alternative should encourage voluntary agreements with private landowners to take measures which would reduce the spread of PL. Better cooperation and understanding would improve protection of private stands (which fill some of the same ecological needs) and Federal stands at the same time. [44-18, 2-26]*

**Response:** The Community Outreach provision applicable to Alternatives 2, 3, and 6 has been edited to include ". . . coordinate with state, local, industrial, and small woodland owners to help meet overall POC management objectives."

**Comment:** *Off-road vehicle users should be targeted in public education efforts, especially where road closures are called for. [44-9]*

**Response:** The Community Outreach provision applicable to Alternatives 2, 3, and 6 has been edited to suggest education and outreach efforts focus on ". . . user groups most likely to engage in activities at more risk for spreading PL."

**Comment:** *Probably under the "Integrated Management Approach", the SEIS should specify that the North Coast Risk Region where POC grows across the landscape would, in some ways, be managed differently from the other parts of the range where POC is more limited to moist sites or along streams. These are site specific decisions that depend on POC presence, PL presence and other concerns such as road stability and soil/terrain stability. [2-9]*

**Response:** The effectiveness of specific mitigations varies across the landscape and from location to location. To allow flexibility, the Management Practices below the risk key are intentionally not ranked, required, or overly specific. Local managers are best aware of these differences and are best able, armed with the discussions in this SEIS and other relevant publications and information, to decide how much each practice reduces risk in their areas. The Comparison of Alternatives section in Chapter 2 briefly discusses how the differences between the North Coast Risk Region and other parts of the range may affect implementation of the selected alternative.

**Comment:** *There is no stated reason for treating firefighting water with Clorox. [44-14]*

**Response:** The Wildfire Fire Operations provision applicable to Alternatives 2, 3, and 4 has been edited to show treatments are to kill water-borne PL spores. This process is explained in more detail in Appendix 4.

**Comment:** *It is unlikely that the heat from surface fire would penetrate soil enough to eradicate PL, especially in wetter soils where POC tend to grow. [25-11]*

**Response:** The reference to prescribed fire potentially killing PL in the soil has been removed in favor of a more generic ". . . additional tools for eradicating PL in the soil would be sought, developed, and implemented as evidence warrants." Study of whether prescribed fire heats the soil enough to be effective as an eradication treatment is included as an example of effectiveness and validation monitoring requirement in Appendix 5.

**Comment:** *PL eradication, and selling POC as part of the treatment, is inappropriate. [29-13]*

**Response:** Depending upon the ecological value of surrounding trees and the extent of infection, it is sometimes appropriate to remove POC in a buffer surrounding an infection. This is a common, albeit typically expensive, way to isolate forest and other diseases when the situation warrants. The decision to eradicate POC in such cases is not made to provide POC for sale, but to accomplish the treatment within available funding is a factor in whether the treatment would be carried out. Sale of the resultant POC products partially helps fund the treatment, and has the benefit of reducing theft by persons who would not respect the seasonal restrictions, equipment cleaning, and other management practices that would be employed to keep the PL isolated.

**Comment:** *Sanitation has not had the desired effect; the alternatives should concentrate on preventing vehicles from spreading the pathogen from infested areas to uninfested areas. [41-1]*

**Response:** As described in the Pathology section, sanitation appears to be effective at reducing disease starts along roads and other areas. The SEIS describes this treatment as not as effective as closing roads, but for reasons described in the SEIS, closing roads is not always an option or the best option. The effectiveness of any given PL control or mitigation practice is a consideration by the manager when determining what practice, or combination of practices, to apply in any given situation.

**Comment:** *The Regional Ecosystem Office (REO) has without public notice or review, NEPA process or scientific basis adopted guidelines for determining when POC sanitation logging can be done in Late-Successional and Riparian Reserves. If the Agencies are going to use the REO guidelines for sanitation logging they must be subject to NEPA review in this EIS process before they can be applied again. [32-83(S)]*

**Response:** The Regional Ecosystem Office examined a POC sanitation project proposal submitted by an administrative unit and found it to be consistent with the NWFP Standards and Guidelines for Late-Successional Reserves. Nothing in that review precluded the application of the NEPA process to that or future projects.

**Comment:** *The Water and Fisheries section identifies inadequate large woody debris levels as a problem for salmonids in southwest Oregon, yet the Agencies preference to sacrifice POC along high-risk riparian areas that support declining salmonids and amphibians would lead to loss of bank stability, loss of shade, and long-term loss of down woody debris. [34-16]*

**Response:** The snag retention Standard and Guideline applicable to Alternatives 2, 3, and 6 adds emphasis to requirements already in the NWFP. This Standard and Guideline provides needed emphasis for leaving POC that are especially resistant to decay and because few replacement POC are likely to become available in the near future. This direction is identified as being particularly applicable on ultramafic soils where POC can be some of the largest and most abundant trees. Thus, there is a stated reluctance, not preference, to "sacrifice" POC along riparian areas.

**Comment:** *Although POC snag retention would be emphasized in riparian areas, it should be prohibited. Nawa (1997) reported that "…the management assumption that a removal surplus of dead and downed Port-Orford-cedar exists in riparian reserves is false. Dead and downed trees appear to have as much influence in maintaining ecosystem functions as standing live trees. No evidence was found for the desirability of an upper limit for managing downed woody debris in streams and adjacent valley surfaces. Thus, there appears to be no scientific conservation rationale for the removal of dead or downed Port-Orford-cedar trees from floodplain forests or Riparian Reserves." [32-69]*

**Response:** Removal of POC from riparian areas is only made after watershed analysis and recognition of the continuing value of dead and down trees, particularly durable species like POC. But while there may be little or no evidence for an upper limit except for fuels considerations, the NWFP specifically anticipated and included provisions for salvage once levels are so high that removal of "surplus" would essentially be neutral to the attainment of Aquatic Conservation Strategy objectives.

**Comment:** *The streamside snag standard and guide defers to the Aquatic Conservation Strategy (ACS) objectives in the NWFP Standards and Guidelines, and these objectives defer to Watershed Analysis to determine if existing large wood levels meet stream management objectives. This is inadequate because watershed analysis often fails to set standards about quantities. Further, compliance with the ACS is likely to become discretionary under revisions being considered the current Aquatic Conservation Strategy SEIS. [32-69]*

**Response:** The streamside snag Standard and Guideline does not mention the Aquatic Conservation Strategy objectives or the NWFP at all, but requires emphasis in the retention of POC snags in Riparian Reserves. However, the Aquatic Conservation Strategy in the NWFP, like any other underlying resource management plan/land and resource management plan Standard and Guideline, does apply to salvage of POC in Riparian Reserves. Whether the NWFP-required watershed analysis recommends specific large wood levels or addresses riparian health and objectives in other terms, the NWFP Standards and Guidelines permit salvage in Riparian Reserves ". . . when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected." Revisions being considered in the Aquatic Conservation Strategy SEIS would not change this provision.

Not all POC removal in Riparian Reserves is salvage, however. Eradication or other silvicultural treatments are appropriate in Riparian Reserves ". . . when needed to attain Aquatic Conservation Strategy objectives." Treatments to prevent the further spread of the disease usually would meet this requirement.

**Comment:** *The Agencies should make special rules for using equipment on Federal lands after it has been used in infested areas, especially in highly infested private lands in Coos County. [34-8]*

**Response:** Alternatives 2, 3, and 6 include a Disease Export provision above the key, specifically for this purpose.

**Comment:** *Alternative 2 contains so much vague language it is hard to tell what would be done. For example, the "integrate management approach" is encouraging, but nothing specific is promised. In general there are few "shalls" and more "shoulds". [31-13]*

**Response:** The Standards and Guidelines in Chapter 2 have been edited with the following words to make requirements clearer. *Must*, *shall*, *will*, and *would* denote requirements. *Should* and *ought* denote actions that are required unless a justifiable reason exists for not taking action. These words recognize extenuating circumstances are likely to occur at times. *May* and *can* specify when actions are optional. However, there are several paragraphs above the key (for example, Planning and Integrated Management) that do not necessarily apply binding language to specific management situations. These paragraphs can best be described as what the Agencies are doing now, and the likely level of compliance with them might best be determined by studying Appendix 2, Summary of Agency Actions for Fiscal Years 2001 and 2002. The effects described for these alternatives recognize the applicability of these provisions and give them appropriate credit.

**Comment:** *Forest-wide direction such as road maintenance seem to be subject to project-based analysis and the risk key. It is not clear this would lead to forest-wide actions to reduce risk from roads, such as doing roadside sanitation or recognizing when roads need to be closed. [31-13]*

**Response:** A paragraph above the risk key requires application of the key to not be limited to any one type of management activity. Agencies will recognize programs in a broader context, such activities will be reviewed to treat chronic problems that are not otherwise within a given project area. This level of review is not intended to require that every ongoing forest activity be immediately subject to a detailed POC risk analysis. It is intended to reduce the spread of PL by implementing effective management practices as activities are initiated.

**Comment:** *More resistant seed than that needed to produce 50,000 to 100,000 seedlings per breeding zone needs to be available for catastrophic events. [26-1]*

**Response:** The genetics provision applicable to Alternatives 2, 3, 4, and 6 has been edited to clarify the difference between operational seed development and need for conservation seedbanks.

## Risk Key

**Comment:** *Alternative 2 (and 3) say that use of the risk key "precludes the need for additional project-specific analysis of risk…." Are the Agencies proposing to implement or not implement disease control measures with no further NEPA analysis based on the risk key? The final SEIS must be explicit on whether the application of the risk key and disease control measures would be disclosed and analyzed in project level decisions. [34-27, 32-8]*

**Response:** The following text has been added to the referenced paragraph:

Project-specific NEPA analysis will appropriately document the application of the key and the consideration of the available Management Practices. Application of the risk key and application of resultant Management Practices (if any), will make the project consistent with the mid- and large-geographic and temporal-scale effects described by the SEIS analysis, and will permit the project analysis to tier to the discussion of those effects."

**Comment:** *On the risk key, the phrase "meeting land and resource management plan objectives" is undefined, and leaves it unclear whether this would increase or decrease future PL control activities. It needs to be quantified. One could claim that allowing new infestations would not meet the management objective of preventing the spread of PL, or one could argue that the loss of downstream POC is negligible. The emphasis should be on protection of the current status of POC; maintaining the ecological and economic importance on sites where it grew naturally. For question 2, you should define "significant risk". [25-13, 33-19, 32-65, 2-10, 39-3, 45-3, 38-9, 29-11, 31-15, 34-10]*

**Response:** Land and resource management plan objectives are familiar concepts to the managers who would be making these decisions, and include: maintaining or working towards desired future condition, including vegetation for habitat, visual values, and providing forest products; maintaining ecosystem health; and meeting law, regulations, and Agency policy requirements for diversity, viability, water quality, and other purposes. Since most of these objectives apply at multiple scales, there is not generally expected to be an issue over whether an objective needs to be met in the project area versus somewhere else. *Significant* has been changed to *appreciable*, and a defintion has been added to the footnote section of the risk key. Five paragraphs of exploration have also been added to define the term's use on the risk key.

**Comment:** *On the risk key, the words "considerably farther in streams" would mean different things to different people. [32-65]*

**Response:** This has been changed to ". . . 100 to 200 feet in streams."

**Comment:** *In the risk key, the determination of risk could be better standardized and made more repeatable by adding distances from roads and the percent of POC, like that shown in Appendix 4 of BLM's POC Management Guidelines (shown in Appendix 1 of the SEIS). [2-10]*

**Response:** The risk key is designed to be flexible enough to work across the range and apply to a variety of situations. Standardizing by adding specific distances would hinder this feature.

**Comment:** *How would use of the risk key be standardized among the different administrative units, especially since FS and BLM regulations differ. [44-15]*

**Response:** While the process and language in the key is clear enough for managers to understand with consistency, the risk key is flexible enough to respond to different situations and different objectives: It would not turn out the same every time, for every manager. It does, however, add considerable consistency and predictability to the application of PL control measures when compared with Alternative 1. It is this improvement in, and not the absolute application of, consistency upon which the predicted reduction in PL spread is based.

**Comment:** *The risk key could be made more specific if a separate one was tailored for each risk region. [2-10]*

**Response:** Perhaps so, but the flexibility of the risk key makes it applicable to a wide variety of situations. As described in the Comparison of Alternatives section in Chapter 2, use of the risk key can be tailored to different situations while producing a reasonably consistent and predictable result.

**Comment:** *The risk key is too subjective. The alternative should make spatially explicit identifications of high-risk areas and identify protection measures. The best way to do this is by expanding the protected watersheds and core areas identified in Alternative 3. The SEIS should have decided what areas were essential and protected them. [32-66, 38-9]*

**Response:** The risk key has been modified so that activities in the 162 uninfested 7th field watersheds always get a “yes” to question #1 in the risk key.

**Comment:** *The risk key could prevent new infestations, but there appears to be no means of avoiding intensification of the disease. Is an area no longer subject to project-specific direction once it is infested? [31-14]*

**Response:** The presence of uninfested areas within infested watersheds or project areas would still be considered by the key.

**Comment:** *The risk key considers “downstream” from the analysis area, but fails to consider the haul routes to the project area. [38-9]*

**Response:** Haul routes are considered part of the analysis area and are therefore considered during application of the risk key.

**Comment:** *The risk key is flawed because listed mitigation is only applied “until the analysis indicates no other treatment is effective or practicable”. There is no scenario in which the key can lead to the answer: The project is too risky and no mitigation would reduce risk enough to make it worthwhile. It needs an option NOT to conduct the project. [33-19, 31-16]*

**Response:** The option to drop or redesign the project has been added to the risk key.

## Below the Risk Key

**Comment:** *Managers should be required to select the most effective management practices rather than the cheapest and easiest ones. Roads should be closed rather than sanitized, for example. [39-3]*

**Response:** It would be good stewardship of Federal resources to apply the cheapest ones that would accomplish the objectives. However, the application of Management Practices is not limited to one. The message in the bottom section of the key has been repeated in the introductory paragraphs for the list of Management Practices to help clarify the Management Practice selection process. Added words include “. . . the one or combination of specific practices best fitting the nature of the risk . . . ” and “As noted in the Pathology section of the

SEIS, combinations of practices can be more effective than single practices, depending on site-specific circumstances."

**Comment:** *The choice of Management Practices is far too discretionary (e.g., "one or more practices…would be applied.") The preferred alternative fails to mandate any particular Management Practices or combination thereof to prevent or reduce the spread of PL; it just says apply "one or more." For example, dry season harvesting should be required and apparently never would be if other seasonal restrictions (owl and murrelet nesting seasons) are in place. [34-10, 38-10]*

**Response:** There are no particular Management Practices or combination specified, but the standard to be achieved is specified. The Management Practice introductory paragraph now includes " . . . the one or combination of specific practices best fitting the nature of the risk and the site-specific conditions would be applied until the answer to risk key question 1 or 2 is no, (or, as noted in the risk key, until the project analysis indicates no other treatment is effective, no other treatment is practicable, the project is cancelled or redesigned, or disease control objectives can be met by other means.)"

**Comment:** *While the menu of Management Practices gives managers flexibility in dealing with specific situations, it would be helpful to offer some indication as to which of these practices are most effective. For example, does putting up posters really rank equally with road management measures in preventing disease spread? [39-3]*

**Response:** Each of these practices is discussed, rated, or otherwise referenced in the Pathology section in ways to provide managers with information about the relative value of each. However, they are not ranked because their relative value and applicability varies by situation. It is possible, for example, there are circumstances where posters might do as much for off-highway vehicle hazard as closing roads.

**Comment:** *Road closures are superior to sanitation logging of infected cedars that are at least still performing certain ecological functions. [27-4, 39-2, 40-3]*

**Response:** Dead trees generally do not need to be removed because harvesting dead trees does not change the amount or condition of roots. In any event, decisions to sanitize along a road are made after considering the effects of tree removal, and considering road closures and other options.

**Comment:** *The strong association between roads and the spread of PL makes it clear that any alternative should include road closures and restrictions as a principle strategy, particularly in uninfested areas of greatest ecological significance. [44-24]*

**Response:** Alternatives 3 and 6 identify the currently uninfested 6th and 7th field watersheds, respectively, and include requirements of no harvesting and closing all discretionary non-mainline roads. The risk key in Alternative 2 places emphasis on the 7th field watersheds. The comparable value of closing roads is well understood. The Road Management measures below the risk key now include, ". . . not building roads, not using existing roads, seasonal or permanent road closures, road maintenance . . . "

**Comment:** *The Agencies should bar motor vehicles from inventoried roadless areas and study an alternative giving wilderness status to roadless areas to reduce the spread of the root disease. A significant portion of the non-wilderness watersheds with uninfested POC are in roadless areas which do not have wilderness designation. The alternatives should provide more protection for inventoried and non-inventoried roadless areas. [41-2, 27-6, 39-2, 40-3, 34-55]*

**Response:** It is clear in the analysis that any management decision that reduces access to the forests is likely to slow the spread of the disease. The SEIS provides analysis for what amounts to various levels of access and management restrictions by examining a range of alternatives defined in part by exclusions in, or emphasis on, uninfested watersheds. A complete examination of a proposal to provide wilderness status or otherwise eliminate vehicles from all roadless areas goes beyond the purpose and need and is beyond the scope of this analysis.

**Comment:** *Roads that are presumed closed have been opened by vehicle users and many roads used by miners are not mapped. [32-72]*

**Response:** A Mining section has been added to Chapter 3&4. That road closures do not always work is acknowledged in the Pathology section and the Incomplete and Unavailable Information section of Chapter 3&4. Similarly, predictions in the Pathology section are based on the full suite of current use levels.

**Comment:** *If the Inland Siskiyou is 60 percent high risk in part because of roads, then roads should be reduced in this area, especially near creeks and wet areas. [44-26]*

**Response:** That would reduce the amount of high-risk area, and road closures would continue to be considered as part of project-specific planning and during overall road management planning under Alternatives 1, 2, 3, and 6. The Inland Siskiyou is heavily roaded in part because it is predominantly checkerboard lands. Issues surrounding efforts to close roads in checkerboard ownership are discussed in the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2.

**Comment:** *The strategy should close roads, including mining roads, and there should be no new roads or road reconstruction in uninfested POC areas. [41-2, 27-3]*

**Response:** Alternatives 3 and 6 prohibit construction of new roads in POC in uninfested 6th and 7th field watersheds respectively. Alternative 2 places emphasis on the 162 7th field watersheds and suggests activities that pose significant risk of introducing PL be changed or mitigated to eliminate that risk. Alternative 6 requires closure of all discretionary non-mainline (tie) roads and sanitation along those that are left.

**Comment:** *Level 1 and 2 roads and trails should be closed in or approaching uninfested watersheds. [(27-5, 39-2, 40-3]*

**Response:** General transportation analysis, including considering potential impacts on POC, are already routinely done. Under Alternatives 3 and 6, additional analysis to specifically determine road needs for POC buffers would also be required. The objective for both of these alternatives is to reduce risk to the POC cores by minimizing or closing most roads in these areas. Alternative 2 also places emphasis on uninfested watersheds as well, and would result in additional protection for those watersheds.

**Comment:** *The strategy should prohibit road construction in the range of POC. [43-82(S), 39-2, 40-3]*

**Response:** Although roads are implicated in the majority of PL spread and therefore road closures, not building roads, and other road-related practices are variously prescribed in some of the alternatives, there is nothing in the analysis indicating a general range-wide prohibition on road construction is needed or appropriate.

**Comment:** *The strategy should permanently close as many roads as possible in infested areas to contain the infestation, as well as permanently close as many roads as possible in and around existing uninfested areas to prevent infections and conserve intact forest communities. [43-83(S)]*

**Response:** The provisions of Alternative 6 and to some degree, Alternative 3, generally do this for the uninfested 7th (or 6th) field watersheds. Roads through infested areas are considered for road closure or other mitigation measures such as sanitation or road surfacing when either project planning or other trigger described above the risk key, coupled with proximity of the infestations and other site factors, indicates a need.

**Comment:** *The strategy should strictly limit off-highway vehicle use in the range of POC. Considering the limited range of this species, off-highway vehicle use should take place in other areas. [43-84(S)]*

**Response:** Off-highway vehicle use would be prohibited within POC in uninfested watersheds under Alternatives 3 and 6, and prohibited in other areas under Alternatives 2, 3, and 6 when an unacceptable risk is indicated by the risk key.

**Comment:** *The Management Practices should include not building roads in the first place, but rather logging by other means or by not logging where this "benefit" is outweighed by the potential effects of root disease. [44-3]*

**Response:** These options have been added to the Management Practices below the risk key.

**Comment:** *Under Management Practices listed below the risk key, partial-suspension skyline systems should be lumped with full-suspension and helicopter in the non-ground-based systems. This would be consistent with standard logging and contract terminology, and the likelihood of moving infested soil with such a system is far more comparable to full suspension and helicopter than to tractors and other ground-based systems. [2-11]*

**Response:** Partial suspension is now included as a "non-ground-based" logging system under the Management Practices.

**Comment:** *The list of Management Practices includes many that would not be effective: (1) Project scheduling during the dry season ignores that fact that significant precipitation can occur during any season; (2) sanitation removal of POC may leave viable inoculum in the soil for many years; (3) equipment washing; and (4) road closures are ineffective, not build-*

*ing roads in the first place is far better but not among the menu items. [34-12, 32-21]*

**Response:** All of these practices would be effective to some degree, and when used in the right situations or in combination with other practices, will often meet risk reduction objectives. It would be inappropriate to say any of these practices would not be effective in any situation. Even so:

1) An additional Management Practice has been added suggesting application of a permit clause that would require cessation of operations for certain rain events.

2) It is recognized sanitation may leave inoculum in the soil, but it does eliminate the production of additional inoculum, thereby reducing risk. Further, sanitation may also be applied to uninfested areas to reduce the likelihood of PL being brought into an area.

3) Equipment washing has been shown to be effective through studies, as described in the Pathology section in Chapter 3&4.

4) "Not building roads" in the first place has been added as an option under the Management Practices below the risk key.

**Comment:** *The most effective means of preventing/limiting the spread of PL are not among the list of Management Practices (e.g., exclusion, minimize entry, transportation analysis and control, no action (i.e., no roads, no mining, no grazing, no timber harvest). [34-12]*

**Response:** The option to cancel or redesign the project has been added to the risk key.

**Comment:** *The vehicle washing requirement applies to vehicles having traveled on roads "deemed at risk for spreading the disease" but fails to disclose how that finding would be made. [34-14]*

**Response:** The Management Practice for Washing Project Equipment has been edited to say such roads are ". . . generally project area secondary roads around diseased POC."

**Comment:** *The thinning spacing objectives are not conservative enough. Why must POC populations be discontinuous? [44-16]*

**Response:** It is desirable for thinned and planted POC to be discontinuous where consistent with resource objectives, so that any future infestation does not travel through the entire stand.

**Comment:** *Non-POC special forest product gathering should be permitted in low-risk sites only, in areas without POC and/or in dry seasons only, with permit conditions strictly enforced. Gatherers should not be allowed to travel between infested and uninfested areas either by car or foot. [44-41]*

**Response:** Non-POC special forest products collection areas such as for personal use firewood collection would, under Alternatives 2, 3, and 6, be subject to application of the risk key and appropriate measures applied to reduce any identified unacceptable risk. Potential measures to be applied include those mentioned in the comment.

## Alternative 3

**Comment:** *The road restrictions proposed for POC cores and buffers [Alternative 3 and 6] will increase the management costs to private landowners within the checkerboard lands. [28-2]*

**Response:** BLM roads are considered private government roads and the Agency retains the right to control activities on these roads including use by the general public. This does not mean that all access is controlled by the BLM. Many of the roads that run through BLM lands are subject to reciprocal rights-of-way agreements. These agreements are legal contracts that have specific terms and apply to the BLM and other party equally. Terms of the reciprocal rights-of-way agreement cannot be modified without the agreement of the BLM and other party in the agreement. As described in the Roads section of Chapter 3&4, access to private land within the checkerboard lands impacted by the Alternative 3 and 6 transportation management Standard and Guideline, particularly industrial private lands, are covered by reciprocal rights-of-way agreements that do not allow for extensive road decommissioning or the discretion to halt new road construction. However, there are a few private landowners that could have their road management and access costs increased if some non-mainline roads are decommissioned or new construction is not allowed on Federal lands due to the transportation management Standard and Guideline in Alternatives 3 and 6.

**Comment:** *Alternative 3 does not meet the purposes of the SEIS or the NWFP because of limitations on timber harvest in the Matrix, limitations on habitat improvement in Late-Successional Reserves, and limitations on the ability to treat fuels in the Core areas. [28-1]*

**Response:** Alternative 3 would create the negative effects cited, but these practices are generally discretionary, not required, under the NWFP. The decision-maker will weigh these effects against other direct and indirect effects to determine what alternative meets the Need and best meets the Purpose.

**Comment:** *While the uninfested watershed maps are coarse in scale, it appears that some areas have frequently used roads, such as the road to Black Butte trailhead in the East Fork Illinois River. Does the "no vehicles" section suggest that this road would be closed to public traffic? This sort of action is probably going to be very unpopular with the public. In fact, perhaps the restrictions inside the core areas are so strict that public sentiment would never allow them to be created in the first place. This option would need to be applied with care, considering other uses of the forest. [33-20]*

**Response:** Alternatives 3 and 6 close or limit use of all discretionary roads in POC cores except mainline (tie) roads. Roads through these areas leading to nearby trailheads could be affected. This has been clarified in the Recreation section in Chapter 3&4.

**Comment:** *In Alternative 3, there is no explanation of the choice of 6th field as the level of analysis. Using such large areas severely limits the areas subject to special protection. [31-18]*

**Response:** Sixth-field watersheds were selected because they are the smallest watershed having a national or even POC range-wide standard for mapping. The Regional Ecosystem Office has compiled multi-agency (agreed-to) 6th field watershed mapping for all of Oregon.

Each of the four administrative units with POC in Oregon has a 7th field map layer, but there are inconsistencies between units that create edge mapping issues. Also the average size of such watersheds varies widely between the FS and BLM. Finally, in some cases, 7th field watersheds do not aggregate up to the standard 6th fields because the mapping was done before the 6th fields were standardized. Nevertheless, the need for a smaller scale approach to uninfested watersheds became apparent as the result of numerous public comments. As a result, a SEIS map of the combined 7th field watersheds has been created and serves as the basis for Alternative 6. Alternative 6 includes a clause that if the watersheds are remapped to some regionally agreed-to standard in the future, the POC core areas being managed under the SEIS map would be held constant regardless.

**Comment:** *Alternative 3 identifies 32 uninfested 6th field watersheds with more than 100 acres of POC. What if more than 100 acres is found in another watershed? Why not use 10 acres of POC instead of 100? How many uninfested watersheds have greater than 10 acres of POC? Smaller stands are important and should be protected. [34-29, 38-3, 38-4]*

**Response:** The provisions of Alternatives 3 and 6 state ". . . actual POC core boundaries would depend on where POC occurs on the ground and the absence of PL, and may include additional watersheds." Regarding the number of uninfested watersheds having less than 100 acres of POC, an analysis was not done for the 6th field watershed of Alternative 3, but was done for the 7th field watersheds of Alternative 6. To the 162 uninfested watersheds exceeding 100 acres, dropping the cutoff to 50 acres would add approximately 90 more watersheds (with an average POC acreage of about 75 acres). Dropping to 25 acres added another 57. As the cutoff was made smaller, GIS slivers and other accuracy issues made the finding more and more suspect. It was noted that the 75 acre average per watershed (using the 50-acre cutoff) was not necessarily all in same location, but could be spread into numerous smaller stands. The practicality of managing these smaller areas as "cores" is a significant management, tracking, and cost-benefit issue and 100 acres was selected as the minimum for these alternatives. This does not mean watersheds containing less than 100 acres of POC are ignored under these alternatives. Smaller areas of uninfected POC, particularly those in uninfested watersheds, would be identified by the risk key and managed accordingly.

**Comment:** *In Alternative 3, the Federal Agencies should have identified the best POC old-growth groves left, and protected those groves. If uninfected old growth is in blocks of 10 or 20 acres, their watersheds should at least be identified so that protections could be implemented on a project basis. [38-3]*

**Response:** The implementing administrative units possess and use the POC maps that show where 10 or 20 acres uninfested stands exist, and whether in uninfested watersheds or not. Through the risk key, these stands would be appropriately considered for avoidance or other protection measures.

**Comment:** *It appears (from previous project analyses) that the POC in Roseburg's watershed number 1710030221002 is planted. The POC EIS ID team should find better core areas than planted POC in watersheds where it does not naturally grow. [38-4]*

**Response:** Two watersheds were counted towards the uninfested watersheds in Alternative 3 in the SEIS because POC was included in more than 100 acres of young plantations on sites not previously containing POC. The criteria for watersheds included in Alternatives 3 and 6 have been rewritten to exclude such watersheds.

**Comment:** *Alternative 3 is apparently rendered meaningless by the Biscuit fire. There is no substantial discussion of the impacts of this or any other fire on POC. There are no described plans to bring the Biscuit back disease free. Substitutions should have been made for the areas lost to fire. [31-11, 31-17, 31-18, 25-6]*

**Response:** The discussion in the Port-Orford-Cedar Acreage Data section of Chapter 3&4 of the Biscuit Fire and its implications to the overall acres of POC has been expanded. Further, discussion has been added to the Fire and Fuels section about the likelihood of future, POC-killing fires. However, as explained in the SEIS, stands receiving 75 percent top kill were removed from the POC GIS database before the Alternative 3 and 6 watersheds were identified, and the POC maps included in the SEIS were created. The POC acreage within the Biscuit Fire perimeter was decreased by approximately 50 percent because of this analysis. Seventy-five percent was used to insure POC acres shown on SEIS maps still retained POC. Subsequent analysis of the Biscuit Fire using other mortality indicators still shows the total POC mortality to be about half the previously mapped POC acres. In any event, live POC, whether on the SEIS maps or not, will be managed according to the provisions of the selected alternative. If surviving POC exceeding 100 acres is discovered in previously unmapped uninfested watersheds, it would result in additional POC cores and buffers under Alternatives 3 and 6. Any plans to bring the Biscuit Fire area back disease free would be outside the scope of this programmatic analysis and would be more appropriately discussed in the EIS for the Biscuit Fire. Substitutions cannot be made for burned areas because the alternatives already include all uninfested watersheds containing more than 100 acres of POC and, in the case of Alternative 6, are more than 50 percent Federal ownership.

**Comment:** *The POC Buffers are meant to protect the core areas, but the mandated actions are few and weak. Roadside sanitation should be added in buffers, and along roads leading into buffers and core areas that are outside the protected watersheds. [31-19]*

**Response:** The Standards and Guidelines for POC buffers are limited because road use and wildland fire operations water movement are the only big issues within the buffers that relate to keeping the buffers disease free. Sanitation is not prescribed because, by definition, there are no POC present in the buffers. If there were, they would been designated as part of the POC core areas. Roads leading into buffers could be important, but can be considered as part of the required transportation analysis.

### Alternative 4/Alternative 5

**Comment:** *The suggestion that the EIS can contain alternatives that do less than the no action alternatives is wrong. Alternatives 4 and 5 do not appear to meet the need of maintaining POC and an ecologically and economically significant species on BLM and FS lands. [21-10, 21-13]*

**Response***:* It is up to the analysis to show that, and it would be wrong for the SEIS to assume, before analysis, that anything less than the current direction was inadequate. Since the court did not necessarily find fault with the current direction, but only that the Agencies had not analyzed it adequately, it seems appropriate to analyze that direction and alternatives that both increase and decrease current protection measures. Alternative 5 also serves as a "no management protection" basis from which to measure the effects of the other alternatives.

**Comment:** *Alternatives 4 and 5 assume that usable resistance exists and that it would be maintained over time, and the technology of re-establishing POC can be developed. None of those have been proven and no plan for use of resistant seedlings even proposed. [25-15]*

**Response:** Alternatives 4 and 5 do more than rely on existing resistant stock and natural resistance (Alternative 5) or an accelerated resistance breeding program (Alternative 4). These alternatives also assume a portion of the POC will not become infested even without the Agencies' control efforts, and that other trees will fill at least some of the ecological roles of POC. These alternatives are included so that these assumptions, and their implications, are analyzed. Alternative 5 is included because it fulfills many of the objectives normally associated with a No-Action Alternative.

**Comment:** *An alternative to provide maximum protection to POC was not presented. Alternative 3 is the best offer in this regard, but it is seriously and arbitrarily limited. [31-11]*

**Response:** Alternative 6 provides more protection, incorporating the concepts of Alternative 3, but focusing on 7th field watersheds. These watersheds are more widely distributed than those in Alternative 3, and contain about 50 percent more uninfested POC cores.

**Comment:** *Including selected 7th field watersheds into Alternative 3 would better comply with the NWFP Aquatic Conservation Strategy objectives. [32-62]*

**Response:** Alternative 6 has been added to the SEIS, incorporating the approach of Alternative 3, but applying it to the 162 7th field watersheds. These watersheds are more widely scattered than those of Alternative 3, and contain nearly 50,000 acres of POC cores.

**Comment:** *The watersheds selected for protection in Alternative 3 are a start, but coho salmon streams and 303(d) listed stream segments would have benefited by identifying uninfested 7th and 8$^{th}$ field watershed such as the Left Fork of Sucker Creek and Khoerry Creek. Including selected 7th field watersheds in Alternative 3 would obtain better distribution of protected watersheds in the planning area; coastal streams are conspicuously absent. [32-50, 32-62]*

**Response:** Alternative 6 has been added to the SEIS, incorporating the approach of Alternative 3, but applying it to the 162 7th field watersheds. These watersheds are more widely scattered than those of Alternative 3, and contain nearly 50,000 acres of POC cores.

**Comment:** *The alternatives do not provide a balanced consideration of competing resources. There should be at least one more alternative that is more protective of POC than Alternative 3, an alternative that would close or seasonally close or decommission more roads which pose a risk to POC and otherwise restrict wet season motorized access to POC areas. [32-41]*

**Response:** There is now an alternative, Alternative 6, that is more protective than Alternative 3. It includes a requirement to close all discretionary non-mainline (tie) roads in POC cores.

There is a Management Practice addressing seasonal restrictions, and another has been added to address storm events. These Management Practices are applicable to Alternatives 2, 3, and 6.

**Comment:** *The draft SEIS failed to display the current system of road closures that would reduce the spread of PL and more importantly, failed to display recommendations from each district about the need for additional road closures or improved gates. These recommendations could have been illustrated and prioritized in the draft SEIS. There is currently no means of systematically identifying roads that are a high priority for closure, and the SEIS provides no specific guidance about how to identify priority roads for seasonal or permanent closure. [32-50, 32-62, 32-72]*

**Response:** Regular transportation system planning done at the administrative unit level is referenced in the SEIS, and linked to the risk key in Alternatives 2, 3, and 6. Standards and Guidelines of the different alternatives would be applied to roads at that time and during projects. For POC cores in Alternative 6, the Standards and Guidelines call for closing all discretionary non-mainline (tie) roads ". . . pending required transportation analysis." However, POC is only one consideration when determining road closures, and the subject is too complex for further road closures to be addressed within the scope of this programmatic SEIS.

**Comment:** *The Agencies should consider an alternative that adds Alternative 3-like protection to uninfested [7th] field watershed with less than 100 acres of POC, to provide protection (1) along streams, especially those in ultramafic areas and streams important to amphibians and salmonids; (2) to protect more watersheds and provide for more genetic diversity; (3) in the 30 plant associations with sensitive plants; and (4) in ultramafic areas where POC is particularly important to riparian, terrestrial, and below ground ecosystems. [34-28]*

**Response:** Alternative 6 has been added to the SEIS, incorporating the approach of Alternative 3, but applying it to the 162 7th field watersheds. These watersheds are more widely scattered than those of Alternative 3, and contain nearly 50,000 acres of POC cores.

## Alternatives Considered But Eliminated from Detailed Study

**Comment:** *Risk ratings need to be developed for each POC stand, and new alternatives should then be drafted based on these ratings. An example of this approach can be found in the draft "A Risk Assessment of Port-Orford-cedar Plant Associations on Federal and State Lands in California" (Jimerson and others in prep). Risk maps are necessary to evaluate the current status of POC populations and to manage the risk to POC biological and genetic diversity. [21-4, 21-5, 21-7, 21-11, 21-12, 21-14]*

**Response:** A "in process" copy of this publication was obtained by the SEIS Team during formulation of the alternatives, and it was examined for concepts and processes that could be applied to one or more of the SEIS alternatives. Although the existing alternatives were developed after reading this and other published POC management ideas and strategies, the basic approach in Jimerson et al. relied on detailed mapping sufficient to assign relative value and risk to each stand. Maps in California, generally done by Dr. Jimerson himself, may have sufficient detail for such an analysis. POC maps in Oregon generally do not have this same detail. The Oregon maps do have sufficient detail for designing appropriate strategies and for conducting an adequate analysis of effects. Possible deficiencies in the Oregon POC maps are acknowledged in the Incomplete and Unavailable Information section and deemed not to be a significant problem. The risk rating approach referenced in this comment is discussed under Manage According to Stand-Specific Risk Assessment Methods in the Alternatives Considered but Eliminated from Detailed Study section in Chapter 2. As noted in that discussion, a similar result is achieved at the project-specific scale by using the risk key.

**Comment:** *All areas with uninfested POC should be withdrawn from mineral entry. [27-3, 39-2, 40-3]*

**Response:** As noted under the alternative Close Roads and Eliminate Mining in Wilderness to Exclude *Phytophthora lateralis* in the Alternatives Considered but Eliminated from Detailed Study section of Chapter 2, mining is an important and legitimate use of public lands, providing raw materials for a variety of industrial uses. Congress considered these uses so important that the 1964 "Wilderness Act" had a grace period for filing and beginning operations on mining claims in wilderness.

There are other measures that can be taken under the Standards and Guidelines of Alternatives 1, 2, 3, and 6. On NFs, operations of any size, and even most prospecting, requires a plan of operation to be filed with the local administrative unit if the proposed activity would likely cause significant disturbance of surface resources. Applications typically trigger an EA or other NEPA analysis. Depending upon the risk, the Agency is required to provide reasonable terms and conditions for the operation. In this case, requirements to follow the same POC management practices used on other Agency activities would be binding on the claimant. The BLM rules are similar.

**Comment:** *The alternative to "Retain All Port-Orford-Cedar Old-Growth Stands and Large Trees" was inappropriately eliminated from detailed analysis. The reason presented in the SEIS is flawed: "This alternative is very similar to Alternatives 1, 2, and 3, in that (1) about 80 percent of the landscape is in reserves that preclude old-growth harvests;…" This is flawed because up to half of the reserves could have already been clearcut before they were designated as reserves. Eighty percent of the landscape is NOT reserved as a late-successional forest. The 20% of the forest that is open to harvesting likely has 50% of the remaining old-growth forests that could be cut - including valuable, disease resistant, genetically diverse, legacy material, Port Orford Cedar. The SEIS should include an alternative to prevent this. [38-8, 34-3]*

**Response:** While it is true up to half of some reserves have been previously harvested or otherwise have younger stands in them, it is also true that over 80 percent of the existing late-successional and old-growth forest is in NWFP reserves. Further, since POC is concentrated more in riparian areas in parts of its range, it, as a species, has more of a tendency to be concentrated within Riparian Reserves than other old growth. Although POC cores have a tendency to be in wilderness and other protected areas, it is still illustrative to look at the percentage of POC core acres that fall in Matrix and thus would be available for regularly scheduled timber harvest (PSQ) if an alternative with POC cores is not selected. The amount of POC in POC cores that are also Matrix is displayed in the Timber Harvest section in Chapter 3&4. There are approximately 2,260 "PSQ" acres in 34,000 acres of POC cores in Alternative 3, and 3,010 "PSQ" acres in nearly 50,000 acres of POC cores in Alternative 6, or just over 6 percent. The percentage of POC in the Matrix is likely much higher in the North

Coast Risk Region where POC is more evenly distributed across the landscape, but the apparent ecological significance of larger POC is also lower here when compared with other risk regions.

The ecological and other values of the larger POC that do remain "available" for harvest will be considered at the site-specific scale. The SEIS has been edited to better describe that the POC remaining on Federal lands is only a portion of what was on all lands historically. Nevertheless, there is no apparent reason to have an alternative that prohibits harvest of any large POC for any reason.

**Comment:** *The alternative to "Focus on Prevention Rather Than Mitigation or Control" were inappropriately eliminated from detailed analysis. The draft SEIS dismisses these alternatives in part because they would not meet the need of supplying POC products. The Special Forest Products section explains that less than 4 percent of the POC bough market is from Federal lands, so why not just forego the risk? There is no legal mandate for the Federal lands to supply something just because there is a demand. If someone wants to sell fur coats made of wolves, does the Forest Service let them? [34-3, 32-37]*

**Response:** The discussion of this considered alternative has been rewritten to recognize the contribution of Alternative 6, revisions to the preferred alternative, and other information.

**Comment:** *The alternatives to "Close Roads and Prohibit Management Activities in Uninfested Watersheds and Small Subwatersheds" and "Impose Stronger Protections" were inappropriately eliminated from detailed analysis. The SEIS dismisses these alternatives based on the unsupported conclusion that they would not meet the need of avoiding "unnecessary" restrictions on public access. The SEIS notes under Potential Mitigation Measures that more road closures would be more effective than any of the developed alternatives but does not consider such as alternative even as a point of reference. Such an alternative would allow the public to scrutinize how many roads, and how much access the public has and how much they need. The Multiple-Use Sustained-Yield Act is broad and can encompass many widely different mixes of use and conservation within its legal framework. [34-4, 32-37, 29-2]*

**Response:** The alternative that was considered but eliminated to Close Roads and Prohibit Management Activities in Uninfested Watersheds and Small Subwatersheds has been removed because the new Alternative 6 responds to these issues. The discussion of the Impose Stronger Protections alternative has been rewritten to recognize the contribution of Alternative 6, revisions to the preferred alternative, and other information.

**Comment:** *The alternative considered to "Impose Stronger Protections" was inappropriately eliminated from detailed analysis. There are numerous locations where stronger protections are warranted and where imposition of stronger protections would not significantly affect the Agencies abilities to meet the Needs section. No analysis was made for such opportunities. [29-2]*

**Response:** The discussion of this alternative has been rewritten to recognize the contribution of Alternative 6, revisions to the preferred alternative, and other information.

**Comment:** *The alternative to "Restore Old-Growth to its Historic Range" was inappropriately eliminated from detailed analysis. The SEIS incorrectly claims that there is a conflict between old-growth conservation/restoration and multiple-use. This unsupported conclusion demands more analysis and scrutiny in an SEIS alternative. [34-5]*

**Response:** This discussion has been rewritten.

**Comment:** *The alternative to "Eliminate Timber Harvest in Port-Orford-cedar Areas" was inappropriately eliminated from detailed analysis. The SEIS dismisses this alternative based on conclusions about multiple use and unacceptable impacts on "other timber harvest objectives" but the SEIS mischaracterizes its multiple use duties and fails to state what those impacts would be. There are only 272,000 acres with POC and the vast majority of this area is already designated as some sort of reserve. Only 92,600 POC acres are in Riparian Reserve/Matrix/AMA, and only a fraction of this is expected to provide significant wood products. If all that land were withdrawn from commodity-driven timber harvest, the regional effect would be insignificant, but the EIS did not disclose this fact, or factor in that timber harvest on Federal lands represents only 13% of the timber harvest within the range of POC and less than 10% regionally. [34-6, 32-37]*

**Response:** The discussion of this alternative has been rewritten to include these points.

**Comment:** *The alternative to "Close More Roads Within Federal Lands" was inappropriately eliminated from detailed analysis. The draft SEIS says that closing more roads is possible even those within the O&C checkerboard, but dismisses it because private right-of-way interests would have to be purchased. High costs are not a reason to refuse to consider an otherwise reasonable EIS alternative. The Agencies are required to consider all reasonable alternatives (even if they are outside their discretion) and this is not outside their discretion. [34-7, 32-37]*

**Response:** This alternative was eliminated because there are provisions within other alternatives to consider closing roads where needed and appropriate. The discussion goes on to note that a substantial increase in road closures is not possible in many cases, at least not without purchasing existing private interests to those roads. The Council on Environmental Quality requires inclusions of alternatives that are "reasonable." Although the Council's "40 Most Asked Questions Concerning CEQ's NEPA Regulations" says alternatives outside of what Congress has funded should be included because the EIS may serve as the basis for Congressional funding (question 2b.), the Questions also describe "reasonable" as ". . . those that are practical or feasible from the technical and economic standpoint and using common sense." In this case, the roads in question access private sections of the checkerboard lands. Purchasing interests in the roads would reduce private land access. The government would thus need to compensate for the loss in value to those lands as well. Expecting a substantial increase in Federal funding for such a purpose is not reasonable. Furthermore, the end result could, in some areas, lead to an increase in roads as the private landowners build alternate access over private lands with more circuitous routes. This is an issue which would be better considered on a case-by-case basis rather than as a programmatic alternative. Closing roads is not precluded by any of the alternatives considered in detail.

**Comment:** *The alternative to Close More Roads Within Federal Lands was inappropriately eliminated from detailed analysis. The O&C Logging road rights-of-way regulations did not* *envision the Federal government getting permanently prevented from properly managing Federal lands. The rights-of-ways envisioned in the law must have expirations and there are numerous methods by which they may be terminated. The Agency has improperly entered into rights-of-ways with numerous landowners. The rights-of-ways are likely mostly illegal and non-binding, and the Federal government should take a hard look at its patchwork of roads and associated rights-of-ways and close and terminate (respectively) those which prevent proper management of Federal resources, specifically prevention of further spread of PL. [29-2]*

**Response:** The requirements and administration of reciprocal rights-of-way agreements is discussed at length under this alternative. These agreements permit access to both Federal and private lands in checkerboard ownership instead of requiring each party to build their own independent road systems. The amount and kind of use restrictions that may be imposed by the Federal government has been tested in court. Further discussion of the legality and appropriateness of continuing these rights-of-ways is outside the scope of this analysis.

**Comment:** *In the discussion of why the draft SEIS did not analyze an alternative which would close more roads on Federal lands, the draft SEIS went on at length about how the Agencies have reciprocal right-of-way agreements and other obligations to keep roads open. Some of the things this discussion did not disclose were what percent of roads in POC areas are subject to such obligations, whether there are any roads which can be closed or decommissioned, and whether the private landowners with whom the Agencies share rights-of-way would be willing to allow at least seasonal closures on these rights-of-way. [32-40]*

**Response:** The SEIS does not say all roads in POC areas are covered by such agreements, but does say a substantial increase in road closures is not possible in many cases, and goes on to explain the situation with reciprocal rights-of-ways. In checkerboard areas, such agreements apply to almost all mainline roads. Knowing the exact percentage or location of each, however, is not needed at this programmatic scale. Road closures, not building roads, and other road-related practices, are described in some of the alternatives. Further, unit road management plans will consider POC-related road closures as they are renewed. There is nothing in the analysis indicating a general range-wide prohibition on road construction is needed or appropriate.

**Comment:** *Closing roads which are no longer needed and/or which pose a risk of becoming a vector for PL, as well as instituting additional protections for POC (i.e., prohibiting off road vehicle use in POC areas) is both permitted and anticipated under the statutes that govern the Forest Service and BLM. Additionally, closing roads and instituting other protections for POC is necessary to preserve and protect the highest and best uses of areas where POC grows. As a result, one or more alternatives which propose to close and decommission some roads (a more aggressive strategy than Alternative 3) and institute stronger protections for POC are reasonable and viable alternatives that should have been considered in the draft SEIS. [32-40]*

**Response:** Alternative 6, and additional provisions in other alternatives, provides the additional protections suggested by this comment.

**Comment:** *Federal POC management must allow private timber owners reasonable access to their private timberlands for management purposes throughout the year. [26-2]*

**Response:** Many of the roads that access private timberlands are covered by reciprocal right-of-way agreements that already allow for the reasonable access of private owners. Additionally, regular transportation system planning is done at the local administrative unit level and would take into consideration the access needs of adjacent private landowners. POC management is but one consideration when determining road management needs.

**Comment:** *Please list POC as endangered under the Endangered Species Act. It meets all five of the factors listed in Section 4 of the ESA. [27-8]*

**Response:** The listing of a species such as POC under the "Endangered Species Act" is beyond the authority of the BLM or FS, and resides under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). Nonetheless, this SEIS analysis concludes that (1) POC is not in danger of extinction throughout all or a major portion of its native range, no matter which alternative is selected, (2) populations exist away from roads and streams which are the carriers of the root disease, and (3) utilization for commercial purposes has been sharply curtailed.

## Comparison of the Effects of the Alternatives

**Comment:** *The document repeatedly mentions "early, prolific seed production" by POC. This is true in greenhouses where trees are given hormone treatment, and it speeds the breeding program. POC also produces seed rather early when open-grown. But in forests, POC in subordinate crown positions produces little if any seed. Because POC growth is slow, in most forests POC trees spend much of their lives beneath the canopy with probably no seed production. Most planted resistant seedlings are unlikely to add resistant genes to the seed rain until they reach the canopy, probably long after the 100-year scope of the document's projections. [25-20]*

**Response:** As described in the newly added planting assumption, most resistant seedlings planted to replace trees lost to PL will not be in subordinate crown positions. Nevertheless, the prediction of onset of seed production for outplanted resistant seedlings in these circumstances has been changed in the SEIS from 5 to 25 years.

## Potential Mitigation Measures

**Comment:** *The following mitigation measure should be added for pathology: Work with private landowners thru small woodlands associations, ODF Service Foresters, and Industrial Forestry Associations to encourage them to apply acceptable (to them) disease control measures on their land. [2-14]*

**Response:** Such a clause has been added to the Community Outreach requirement applicable to Alternatives 2, 3, and 6.

**Comment:** *In checkerboard ownerships such as on the Coos Bay District, voluntary road treatment and control programs could be encouraged. [44-13]*

**Response:** Within the Community Outreach requirement in Alternatives 2, 3, and 6, a requirement to ". . . coordinate with state, local, industrial, and small woodland owners to help meet overall POC management objectives . . ." has been added.

**Comment:** *It is unclear how or whether the SEIS considered the mitigation measures at the end of Chapter 2. Examples include: allowing restoration thinning in some dense young plantations, and allowing fuel reduction treatments in the wildland-urban interface. Consideration of these mitigation measures would substantially improve the outcomes under Alternative 3 and other Alternatives that were eliminated from detailed study. [34-9]*

**Response:** Council on Environmental Quality Regulations at CFR 40 1502.14(f) and 1502.16(h) require a discussion of mitigation measures for all adverse effects identified in the SEIS that are not otherwise included in the alternatives. (The alternatives themselves are mitigation measures, and measures already included in the alternatives are generally not included in this section.) A clarifying sentence has been added to the mitigation section at the end of Chapter 2 stating ". . . in general, mitigation measures listed . . . are ones not explicitly part of the referenced alternative, or at least not part of the alternative at levels that would completely mitigate the adverse effect described."

**Comment:** *The Agencies should consider an effective and timely annual trail maintenance program so that hikers are more likely to stay on trails. [34-11]*

**Response:** Timely maintenance of trails so hikers can stay on them has numerous benefits, with the protection of POC being one of them. POC considerations are one factor the Agencies use to set priorities for trail maintenance.

## Chapter 3&4

### Introduction

**Comment:** *The SEIS should describe the value of roadless and wilderness areas in conserving POC, and consider expanding roadless areas as a de facto mitigation measure. [43-78(S)]*

**Response:** The value of roadless areas is apparent in the delineation of uninfested watersheds and in the discussion of how the disease spreads in the Pathology section in Chapter 3&4. The primary difference in the percentage of high-risk sites between the Siskiyou and Inland Siskiyou Risk Regions, as explained in the Pathology section, is that the Inland Siskiyou is more heavily roaded. "Expanding" roadless areas, already inventoried based on an absence of roads, could only be done by closing roads. Closing discretionary non-mainline roads is required within uninfested POC cores in Alternative 6, and an effective option for reducing risk identified by the risk key in Alternatives 2, 3, and 6. A decision to maintaining existing roadless areas in a roadless status is outside the scope of this analysis because the potential benefits to POC can essentially be achieved in less impacting ways within the elements of other alternatives.

**Comment:** *A prototype POC Management Plan was presented as an example at the 1999 POC seminar. I understand it is being implemented as much as possible by a forestry consulting firm in Coos Bay, within the current constraints of resistant POC seedling availability. [2-16]*

**Response:** Scoping, examination of published strategies that could be found, examination of the 1999 POC Seminar notes, the involvement of Agency POC program managers, discussion with Oregon Department of Forestry officials, and public comment on the SEIS were all explored by the team developing the alternatives examined in this SEIS, and relevant elements were included.

## Incomplete or Unavailable Information

**Comment:** *The draft SEIS Incomplete and Unavailable Information section statement that "no missing information was identified that is essential to a reasoned choice among the alternatives" is not justifiable. Among topics with incomplete information in the document are: uncertainties about which geographic areas will produce resistance, whether there will be sufficient genotypes with resistance to support a wide program of planting, whether that resistance will hold up over a rotation, how to manipulate vegetation to assure success of planted resistant seedlings, how many resistant trees need to be planted to improve stand resistance sufficiently, where POC genotypes can be successful if planted outside their native habitat, how well measures to reduce spread of PL really work, how the long-distance spread of POC has occurred, how long PL can survive in soil without POC… I agree that decisions will have to be made now, without all the desirable information, but that does not require such untrue statements to justify it. In contrast, this document needs to identify clearly the information needed for the best POC management, suggest mechanisms for getting it, and provide a mechanism for the revision of management as the information needs are met. [25-21, 25-24]*

**Response:** There is adequate information described in the SEIS to address most of the mentioned items. The Genetics section notes that few resistant trees have been confirmed in some breeding zones, but few trees have been tested. Based on the distribution of resistant genes so far, there is little reason to believe resistance will not be found in sufficient levels in all zones. Manipulation of vegetation to ensure success of planting seedlings is an area in which the Agencies have hundreds of thousands of acres of experience. Similarly, silviculturists and geneticists have considerable experience with moving planting stock outside of established seed zones or plant associations, and a potential reduction in adaptability is referenced in the new planting assumption. Genetic variability within stands is high; as noted in the Genetics section, maintaining major alleles with limited resistant stock is not a problem, in part because mortality does not typically affect all trees in anything larger than a small geographic area. The Pathology section has been edited to more thoroughly discuss the effectiveness evidence for the various PL control measures. The Pathology section specifically discusses each of the longest PL spread events and what is believed to have caused them where known. Studies indicate inoculum, in the absence of POC, decreases in the soil over time. Studies so far have run 8 years, and wording in the draft indicating inoculum might last "up to 10 years" has been changed to read "at least" 10 years. Nevertheless, the commenter makes a good point that none of this information is perfect or, even though limited knowledge is acknowledged elsewhere in the SEIS, it should be summarized here and potential risks acknowledged. The SEIS has been edited accordingly. As described in the Monitoring sections of the alternatives, Appendix 5, the agencies will continue to examine the effectiveness of various treatments and modify practices accordingly.

**Comment:** *There are several places where the draft SEIS describes incomplete information, including imprecise POC acreage information because of mapping techniques or GIS limitations. The SEIS should identify the information needed for the best POC management, suggest mechanisms for getting it, and provide a mechanism for a revision of management as* *the information needs are met. [25-24]*

**Response:** The existing maps are more than adequate for the design of the programmatic alternatives in the SEIS and to evaluate the likely effects. As noted under in the Incomplete and Unavailable Information section, precision and certainty could be added by having more detailed maps, but to the degree such details would affect site-specific management, they will be discovered during project planning and addressed in subsequent site-specific NEPA. There is no expectation that improving maps or other data will negate or significantly change the predicted effectiveness of any alternative analyzed in the SEIS. Therefore, there is no need to consider the direction "interim" while additional specific information is gathered.

The monitoring plans for each of the Action Alternatives, Appendix 5, note the ongoing process of updating Agency maps. Contracts for such updates are in effect as the SEIS is being prepared. These maps improve site-specific application of the POC management direction today, and they will continue to do so under the selected alternative.

**Comment:** *The draft SEIS Incomplete and Unavailable Information section statement that the "assumptions…are based on consideration of 50 years of forest management activities" is not true. Following the advent of PL in the native range and the collapse of POC prices, the species was abandoned as a commercial entity. Management in the face of the disease began in the 1970's at the earliest, only after the Japanese market was re-established, and management throughout the range was not mandated until late in the 1980's. [25-25]*

**Response:** This and a similar statement elsewhere have been revised to more accurately reflect basis of experience.

**Comment:** *The SEIS Incomplete and Unavailable Information section states that "…it is possible to make predictions about the future spread of PL. This statement is true for spread by water and along roads. But allowing off-road vehicle travel and POC bough harvest, and considering spread by grazing and wild animals, removes much of that predictability. [25-26]*

**Response:** It is true that spread by water and along roads is predictable, so much so that time-sequence maps have been prepared of infestation for at least one watershed based on short-term data. The predictions made in the SEIS, however, are simply an acreage spread rate prediction that includes spread from watershed-to-watershed and across the range that, while not applicable to any specific watershed or direction, are nevertheless soundly based on observations of spread processes, knowledge of the road systems and forest-use levels, personal observation of medium- and long-distance spread over the past two decades on the part of Agency pathologists, and overall consideration of spread patterns and rates since the pathogen was first discovered in the Coos Bay area in 1952. However, the limits of the predictions and the need to check progress with monitoring are better acknowledged in the final SEIS.

**Comment:** *The effectiveness of the resistance breeding program constitutes incomplete and unavailable information which, while perhaps not "essential" to a reasoned choice from among the alternatives, precludes Alternative 4 from being the preferred choice as it relies entirely on an untested program to meet the Purpose and Need. [44-20]*

**Response:** A discussion of the uncertainties about the resistance breeding program has been added to the Incomplete and Unavailable Information section in Chapter 3&4.

**Comment:** *If the currently proposed Forest Health Initiative is passed, it could significantly increase the amount of traffic and pressure for road building in POC habitat. [39-5]*

**Response:** The possibility of the Forest Health Initiative increasing traffic has been added to the Incomplete and Unavailable Information section in Chapter 3&4. However, it is unlikely the Initiative would increase traffic beyond that which was envisioned with full implementation of the NWFP, which is already an assumption in the SEIS.

**Comment:** *The draft SEIS states that riparian POC plant association data is not fully available for Oregon. (3&4-44) This is a significant data gap. This information should be obtained and disclosed before any decision on this SEIS is made. At the very least, the draft SEIS should have identified the relevance of this unavailable information to the evaluation of the environmental effects of the proposed action and alternatives. [32-23]*

**Response:** The preliminary analysis did not indicate any resource issues relevant to plant associations. The Ecology section, among others, discussed the effects of the alternatives on plant associations, riparian ecosystems, and unique plants. The Genetics section discussed whether individual plant associations are likely to have unique alleles (they are not). No adverse effects particular to any specific plant association were identified. However, further information about plant associations in riparian areas was obtained between draft and final SEIS and used particularly to help determine the amount and level of POC stream shading along streams important to listed coho salmon. Information about plant associations are now included in the Water and Fisheries and the Ecology sections.

## Cumulative Effects

**Comment:** *It is not clear why the Agencies consider the risk of PL spreading from Oregon to California worth mentioning, but not the risk of PL spreading from California to Oregon. PL is spread not just through timber sale activities, but through recreation (particularly motorized recreation), special forest product gathering, and other activities. The risk of these types of activities spreading PL between the two states should have been more thoroughly analyzed in the draft SEIS. [32-18]*

**Response:** As noted in Chapter 2, the current management direction for the California NFs is included in the SEIS and is held constant across the range of alternatives. The relative effectiveness of that direction is considered in the PL spread rate predictions. Potential methods of spread from California are noted: for example, there is a discussion of logging truck traffic to Oregon from NFs in California in the Timber Harvest section. There is also a discussion in the Recreation section noting off-highway vehicles can be driven or transported both ways between California and Oregon. These potential carriers are considered in the PL spread predictions for the various alternatives.

There are two reasons why the discussion of spread appears one sided, however. First, the level of infestation is generally lower in California and therefore the likelihood of spread from California to Oregon is lower. Second, and more importantly, the SEIS must include a cumulative effects analysis of the foreseeable effects of the alternatives. The alternatives only apply to Oregon. Therefore, the primary issue, with respect to spread, is whether the alternatives and related actions of the action Agencies contribute to the spread of PL to other ownerships including California.

**Comment:** *Despite the strong direction from the 9th Circuit regarding cumulative impacts analysis, the SEIS contains inadequate and inconsistent (between resources) cumulative effects analysis. There are only two sections (long distance spread and water and fisheries) in the draft SEIS that discuss cumulative effects. [32-33]*

**Response:** A fuller range of effects has been added to the various resource element discussions as appropriate. As described under the Cumulative Effects heading early in Chapter 3&4, six different types of effects are included in the SEIS. The individual resource element effects discussions now include effects of the Standards and Guidelines directly on the resource area (reduction in timber harvest, for example), the effect of various forest management activities on the spread of PL across the range (expressed as a 100-year PL spread prediction in acres), effects on resource areas via the effect of the alternatives on PL-spread (such as stream temperatures), the indirect effect of various PL-controlling measures on non-POC resources (road closures also protect soil stability and thus water quality, for instance), effects of management activities on non-Federal lands or outside the planning area to PL spread (such as spread from infested checkerboard lands, risks of PL import from California), and effects of the alternatives on non-Federal lands and those outside the planning area (risk of spread to National Park Service lands and into California) As noted early in Chapter 3&4, the combination of these effects, all of which are expressed in terms of 100 years, represent the cumulative effects of the various alternatives. Attempting, in the various resource element sections, to identify which of these various direct or indirect effects are the "cumulative" ones would be moot at best, and more likely misleading.

**Comment:** *The 9th Circuit Court case law holds that a SEIS must adequately catalogue the relevant past projects in the area. It must also include a useful analysis of the cumulative impacts of past, present and future projects. This requires discussion of how future projects together with the proposed project will affect the environment. The SEIS must analyze the combined effects of the actions in sufficient detail to be useful to the decision-maker in deciding whether, or how, to alter the program to lessen cumulative impacts. Detail is therefore required in describing the cumulative effects of a proposed action with other proposed actions. [32-34]*

**Response:** The Affected Environment sections in Chapter 3&4 for those resource areas potentially directly affected by application of the provisions of the alternatives (for example, Timber Harvest, Special Forest Products, and Recreation), are written with somewhat more detail than would be needed to establish a base from which to determine direct effects of the alternatives. This additional detail is intended to provide the Pathologist and the decision-makers with a description of the scope and nature of activities on the forest affecting PL spread. Chapter 1 has also been edited to acknowledge that past level of past management activities and the lack of specific control measures have contributed to where the disease is today. Finally, the assumptions in the Pathology section and Assumptions section early in Chapter 3&4 discuss, among other things, anticipated future activity rates. Together these sections provide a picture of past, present, and future activities sufficient to predict PL spread rates and related effects for the different alternatives.

**Comment:** *The draft SEIS fails to disclose the multiple benefits of closing and obliterating roads. Such closings would reduce PL and sediment that harms fish; they would reduce off-highway vehicle use that spread PL and harm to rare or sensitive plants; they would improve elk and wolverine habitat. [32-49, 32-62]*

**Response:** Measures in the SEIS would require some roads to be closed under Alternatives 3 and 6, and additional (cumulative) benefits of those closures are variously included within the respective effects sections. The benefits of such closures have been added to appropriate resource effects sections in Chapter 3&4. Most future road closures under Alternatives 1, 2, 3, and 6 would result from site-specific analysis or consideration under unit-wide transportation plan updates, with PL control and mitigation measures considered as indicated by risk. In those analyses, the cumulative beneficial effects of road closures will also be considered.

**Comment:** *The draft SEIS fails to describe how the various Management Practices interact to magically prevent POC infections. The Water and Fisheries effects section for Alternative 2 hints at how practices might interact, but the SEIS needs a comprehensive crosswalk table to explain how this is going to work. [34-10]*

**Response:** Provisions of Alternatives 2, 3, and 6 call for an integrated management approach using all categories of PL control and mitigation techniques. Language below the risk key has been edited to clarify that combinations of treatments are expected to the degree necessary to achieve risk reduction objectives. The discussion of various mitigations measures in the Pathology sections includes a discussion of the benefits of combining treatments. The Water and Fisheries discussion for Alternative 2 is an excellent example of how the process will work, and indicates the effects authors understood the application and benefits of this process. However, because the number of combinations and their applicability to any given situation is so variable, it is no more possible to present a crosswalk table than it would be to rank the 15 Management Practices by priority.

## Relationship to the Northwest Forest Plan

**Comment:** *The draft SEIS assumption that the NWFP will be implemented as written and intended does not disclose that the Aquatic Conservation Strategy and Survey and Manage provisions of the NWFP are being severely weakened and eliminated, respectively, through administrative actions. [32-19, 39-5, 31-7]*

**Response:** The Aquatic Conservation Strategy SEIS stated Need is to fix Aquatic Conservation Strategy language preventing the NWFP from reaching its stated goals. There is no objective to change those goals or to have the Aquatic Conservation Strategy do anything other than what it was intended to do when the NWFP was written. Any changes in the Aquatic Conservation Strategy resulting from that SEIS are still expected to conform to the assumption in the POC SEIS that the NWFP will be fully implemented.

The Survey and Manage NWFP mitigation measure is indeed proposed for removal, with some of the species being moved to Agency special status species lists for future management. However, the current declared PSQ of 805 million board feet annually for the NWFP area does not include a reduction for Survey and Manage. Estimates of harvest levels in the POC SEIS are based on this declared PSQ level, and none of the alternatives in the Survey and Manage SEIS, including the proposed action, would increase PSQ above this level.

**Comment:** *The draft SEIS assumes that "reserves" will continue in the future (NWFP section, Pathology section), however the BLM just signed a settlement that commits them to consider new RMPs that are consistent with 9th circuit case law and do away with all reserves on O&C lands except to the extent they are required to avoid ESA jeopardy. This settlement could lead to an outcome completely inconsistent with the SEIS assumption. The SEIS should disclose the consequences of loss of reserves on O&C lands. [34-34, 31-7]*

**Response:** The referenced settlement calls for BLM to revise the resource management plans for the Districts within the NWFP area, evaluating at least one alternative that rolls back the reserves to the minimum needed for federally listed species, and to complete that revision by 2008. The BLM is not ". . . committed to do away with [existing] reserves." Given the timeframes involved and the nonbinding nature of the agreement relative to the alternative likely to be selected, there is little reason for the POC SEIS to speculate upon, and accommodate, the settlement agreement alternative. It would be more appropriate for a resource management plan amendment to each respective and appropriate EIS to consider the effects of various alternatives on the adopted POC management strategy.

**Comment:** *The draft SEIS statement that the NWFP reserve system created de facto protection areas for POC fails to recognize that LSRs are already highly roaded and allow off-highway vehicles, and will be managed extensively in the future for plantation restoration, fuel reduction, special forest products, and fire management. All these activities can easily spread PL, so the analysis in the SEIS is skewed. [34-37]*

**Response:** While it is true these activities are variously permitted or expected, in different locations, depending upon where they are needed or happened historically, the reality is that even if the NWFP is fully implemented (which is the SEIS assumption), overall management activity within Late-Successional Reserves is a small fraction of what it was before adoption of the NWFP. The full citation from this section states, "In many ways the reserve system of the NWFP created de facto protection areas for POC. Certainly the risk of exposure has been reduced for many POC stands as a result of these allocations." In context, the statement is true.

**Comment:** *The draft SEIS incorrectly states the NWFP did not address POC because it was outside its scope and purview. Appendix A of the FSEIS for the NWFP (the FEMAT report) states ". . . it is critical for the conservation of [POC] to close roads and restrict further road construction in watersheds that contain uninfected stands (e.g., inland California populations)" (FEMAT pg. IV-123). [32-4]*

**Response:** The SEIS has been revised to correct this omission.

## Assumptions and Clarifications

**Comment:** *Wasn't the original intent of the Range Wide Assessment to develop a conservation strategy for POC? It is not clear to me from the SEIS what became of that effort and what the relationship is between the SEIS and the Range Wide Assessment. [21-1]*

**Response:** The POC Range-wide Assessment, begun by the Agencies in 1998 and referenced in this SEIS, was designed primarily for internal (Agency) use to provide a comprehensive summary of recent information about POC. It will be released before the final SEIS for POC.

At one point it was to include a chapter suggesting a conservation strategy, but that concept was dropped in favor of developing alternatives for this SEIS.

**Comment:** *The SEIS needs to account for new technology and new behaviors such as new and more powerful off-highway vehicles, and GPS geocoaching which encourages off-trail travel. [34-13]*

**Response:** The Recreation section in Chapter 3&4 has been rewritten to discuss these use changes.

**Comment:** *The draft SEIS assumes that the Agencies will attain declared PSQ timber targets, but of course they will not. If monitoring is to pick up departures then it needs to be based on an accurate expectation of timber harvest. [34-34]*

**Response:** Some commenters maintain use levels consistent with full implementation of the NWFP as intended will not occur, while others maintain the Forest Health Initiative and the recent settlement agreement directing the BLM to consider a resource management plan alternative of rolling back the reserves to the minimum needed for federally-listed species will increase use levels above those predicted for the NWFP. The NWFP use level assumption is consistent with other recent Agency EISs and there appears to be scant reason to change it at this time. Regardless of actual use levels, if the PL spread predictions turn out to be correct, no adjustments would be indicated.

**Comment:** *The assumptions in the Pathology section unrealistically deny the very real possibilities of increased forest use associated with increasing human population, harvest pressures, and associated changes in land use allocation. [31-9]*

**Response:** The assumptions apply only as long as they are valid, and increases in use will signal a need to be even more vigilant in comparing actual PL spread with predictions in the SEIS. However, increases in recreation, special forest products, and similar uses are predicted, and may offset the reduction in timber management activities from levels of the 1980s. Future activity levels are arguably lower, higher, or about the same as past levels, and the SEIS has made a reasonable assumption. Regarding land use allocations, the SEIS assumes no change. If demands or other factors cause land use allocations to be reconsidered, then implications to POC management need to be reconsidered as well.

**Comment:** *Matrix and Riparian Reserve acres are lumped together in the table of gross and POC acres by NWFP land allocation. Surely the Riparian Reserves are mapped, and the acres in these two very different land allocations could be displayed. [44-21, 44-22]*

**Response:** Because Riparian Reserves surround seeps, springs, intermittent steams, and unstable soils, project Riparian Reserve mapping generally relies on site-specific information and field verification. Therefore, the SEIS estimates of Riparian Reserves (and non-forest areas) is a percentage of the Matrix/Riparian Reserve land allocation, based on individual administrative unit experience. The units have created a Riparian Reserve map for use in GIS that can be used for some estimates. For example, such maps would be a fairly accurate tool for matching plant associations with Riparian Reserves along fish-bearing streams. But because many soil and water features do not show up on the underlying U.S. Geological Survey base maps, the Riparian Reserve GIS maps likely underestimate total Riparian Reserve acres.

**Comment:** *The draft SEIS assumption that there will be adequate funding to implement the selected alternative is flawed. The appropriations for the Agencies are not in an upward trend, and it is very unlikely that there will be enough money to fully implement a POC management strategy. At the very least, the draft SEIS should have outlined a prioritization plan for different components of a POC management plan, so that the public and the decision-makers could make an informed decision about what alternative would protect POC in the most efficient and effective manner. For example, given that the Agencies have a road maintenance backlog and will probably not receive funding in the foreseeable future to adequately maintain all roads that need it, the most efficient and effective way to manage for protection of POC may be to close and/or decommission roads that are not used often or that pose a significant threat to POC, wildlife, and/or water quality. [32-19]*

**Response:** Most of the elements of the strategy are mitigation measures related to specific activities, and thus will be implemented as part of the costs of those activities. Other elements of the action alternatives are being implemented now. The biggest difference between Alternative 1 and Alternative 2 is not an increase in the types of treatments, but the risk key that will lead to more consistent implementation and the added protection of uninfested 7th field watersheds. As shown in the Cost section of Chapter 3&4, the estimated implementation cost for the Proposed Action is actually less than the current direction. The largest cost item, the resistance breeding program, is acknowledged to be dependent upon available funding.

**Comment:** *The SEIS assumption that gates will work "most of the time" is highly suspect. The only evidence that the draft SEIS offers in support of this assumption is unpublished data from a sampling of gate closures which purported that 90% of gates were intact and apparently effective in preventing entry. The truth is, the Agencies don't have a clue how often gates are breached (or how many keys to gate locks are given to members of the public by Agency personnel). The Siskiyou Project, KS Wild, and other organizations and members of the public frequently find that gates have been breached, and notify the Agencies of this fact. Many times, the Agencies ignore the fact that gates have been vandalized or left open. [32-19]*

**Response:** This may be a case of remembering the exceptions, and further, not necessarily knowing why a particular gate is in place and when it is supposed to be open or closed. The sampling discussed in the Pathology section represents a systematic random sampling, and helps meet commitments to monitor the effectiveness of various PL control strategies. The Pathology section goes on to acknowledge that gates are not as effective as permanent road closures, and managers addressing individual risk situations will use that information accordingly.

**Comment:** *The statement that resistant seed can now be used to achieve large POC on high hazard sites is premature given the experimental stage of this program, and cannot at this point be relied on as a certain source for large POC. [44-37, 37-5, 25-1]*

**Response:** Uncertainties about the durability of resistant seed for mitigating POC loss are displayed in the SEIS, and has been variously edited to place more emphasis on reducing disease spread and less on the benefits of planting resistant stock.

**Comment:** *The draft SEIS does not adequately address the issue of time lag. Even if resistant varieties become available, there will not be developed, out-planted in all the remote areas of the forest, reach maturity, and become fully functional in the ecosystem for several hundred years. It's true that dead POC do provide some habitat complexity that helps bridge the gap, but the EIS does not recognize the temporal gap in POC recruitment into all its diverse ecological roles. [25-4, 34-30, 33-12, 4-6]*

**Response:** A planting assumption has been added to the Assumptions section of Chapter 3&4, and a discussion of expected growth is included in that section. References to "several decades" have been removed or changed to 100 years.

**Comment:** *The availability of resistant seedlings is key to the involvement of industrial and non-industrial forestland owners. [2-17, 26-1]*

**Response:** A requirement to coordinate with other owners to achieve overall POC management objectives has been added to the Standards and Guidelines of Alternatives 2, 3, and 6. This includes developing or facilitating development of enough resistant seed to supply private lands.

**Comment:** *The draft SEIS needs to establish some parameters for planting disease resistant stock and how these areas will be managed in the future. The draft SEIS needs to address whether or not resistant stock should be planted in infested areas, and the outcome of planting disease resistant stock. [25, 15, 32-64]*

**Response:** The newly added planting assumption in the Assumptions section of Chapter 3&4 addresses these points.

**Comment:** *Once disease resistant stock is planted, the Agencies will claim that protections such as seasonal or permanent road closures are unnecessary and precautions such as vehicle washing during fires will be removed. The SEIS needs to explicitly state that PL spread preventions must remain in effect even though disease resistant stock has been planted. [32-64]*

**Response:** Planting is one of the management practices available to mitigate adverse effects identified through the risk key (Alternatives 2, 3, and 6) or through other site-specific analysis. However, the Planting Assumption in Chapter 3&4 and Appendix 6 describes the minimum time for planted POC to become large enough to significantly contribute to ecological function as being 50 to 100 years, depending upon the level of stand tending taking place. Clearly, short-term mitigation of most ". . . measurable effects on land and resource management objectives . . . " can not be accomplished simply by planting trees. If Alternatives 1, 2, 3, or 6 are chosen, implementation of a combination of treatments would continue for the foreseeable future, depending upon the nature of the effect to be mitigated.

**Comment:** *The area of POC could be increased by planting POC onto sites that are suitable for the species but currently have none. It is clear to me from my photo surveys that red alder is an excellent indicator of sites suitable for POC. There are other indicators also such as aspect, soil depth, etc. I have successfully introduced POC onto my tree farm using this concept and feel it can be applied on Federal and private forest land. These sites, even if* *classed as high risk, are uninfected and have a lower likelihood of becoming infected in the future. [2-1]*

**Response:** This opportunity is described in the newly added planting assumption.

**Comment:** *In addition to protecting existing stands and replanting killed stands, Agencies can try to increase the acreage of low-risk POC stands by planting seedlings on drier topography (e.g., farther away from streams than it occurs naturally). I believe that the limitation of POC to streamsides in many locations is a result of drought intolerance of very small seedlings, which can be bypassed by planting nursery stock. This applies to any alternative. [25-9]*

**Response:** This opportunity is described in the newly added planting assumption.

**Comment:** *Restoring POC with resistant stock will only happen if two activities are successful:*

> *1) Resistance is discovered in genotypes suited to that specific environmental region or can be transferred into such genotypes. Much work has gone into discovering resistant trees, but known resistance is still sparse for much of the range and its effectiveness over even part of a rotation remains to be proven.*
>
> *2) Some management methods are developed and successful at allowing resistant seedlings, planted into existing vegetation, to reach the canopy on those sites where POC has been killed. The methodology for using resistant POC seedlings is not presented here. So far as I know, no significant proposal has been made for how to use resistant seedlings to return POC to its previous importance in an ecosystem; Appendix 6 provides only a few guidelines for developing such a proposal. Using resistant POC is an important but unproven tool, and no management to maintain POC should be based on that method alone. [25-2, 25-10]*

**Response:** Although resistant trees have not been found in all breeding zones in sufficient numbers to supply genetically diverse seed for reforestation purposes, neither have many trees been tested in these same zones. Indications are that a sufficient genetic base will be found.

**Comment:** *The objective should be to increase the resistance of POC to disease by planting resistant stock wherever POC is cut and risk is high or moderate, as well as replacing stands killed by PL. [25-8]*

**Response:** The newly added planting assumption describes these two opportunities.

**Comment:** *Page A-46, Appendix 6] This appears to be the only description of how resistant POC might be introduced into the forest—but these are simply suggestions for developing a methodology. I have the following disagreements with this appendix:*

> *a) Item 3. There is little co-occurrence with western red cedar; it cannot be assumed to take the place of POC killed by PL except in a few local areas. Incense cedar has a*

*partially overlapping range but different microhabitat requirements in most places I have seen it.*

*b) Item 5. I do not recommend underplanting without providing some overhead light for the planted POC. POC usually naturally invades disturbed areas along with Douglas-fir, but then becomes an undercanopy later, because the fir grows faster. I doubt that POC will grow well enough to make the canopy if planted in heavy shade. Underplanting in gaps in sparse stands may be more successful.*
*c) I do not understand the intention of "Integrate the use of resistant stock with other management techniques such as prescribed fire", or of "Resistant stock will be used in a manner which does not compromise the health of natural stands."*

*d) If resistant stock is really resistant, why not plant it where infection risk is high? I thought that was the point of developing resistant stock. Not planting where risk is high will exclude much of the interior part of the range, where POC is primarily along streams, from use of resistant stock.*

*In addition to the points listed, the following need to be considered: consider competition—will resistant POC be planted only after disturbance such as harvest or fire, or will resistant trees be planted into undisturbed vegetation?; if only after disturbance, will this not remove much of the range from the use of resistant stock for the foreseeable future?; if resistant POC is planted in undisturbed areas, will brush or the trees that replaced the dead POC be removed or treated? [25-30]*

**Response:** The guidelines in Appendix 6 for developing a methodology have been replaced with an assumption of planting levels and locations, and subsequent growth. The section eliminates the reference to western red cedar. Plantations, which are assumed to be installed in PL-mortality, harvest, or fire areas are assumed to receive site preparation, release, and thinning treatments sufficient for them to reach growth objectives. Since resistant stock may foster PL without showing effects, planting of resistant stock will not be done where "bridges" for PL from infested areas to uninfested areas would result. Such areas include high public use areas where PL can be picked up on shoes and transported to other areas.

## Port-Orford-Cedar Background

**Comment:** *The potential for commercial exploitation of POC is not adequately discussed. [43-76(S)]*

**Response:** Commodity production including POC logs and POC products can be consistent with management objectives identified in the land and resource management plans for the Siskiyou NF and the BLM Districts engaged in the SEIS. Applicability of commodity production is a function of the resource objectives and land use allocation for a specific site.

**Comment:** *A POC stand should be defined as any stratified stand or timber harvest unit with more that 1% of volume, basal area or number of trees. Riparian stands should be stratified separately from upland stands. [2-4]*

**Response:** Stand is defined in the Glossary of the SEIS. There are no quantifiers in the definition for amounts of POC in a stand. Riparian POC stands are recognized separately from upland stands in the analysis done in the Ecology and Plant Associations and Water and Fisheries Sections of Chapter 3&4.

**Comment:** *The SEIS is incorrect when it says "POC seems largely restricted to moist sites where the regionally common species (Douglas-fir and western hemlock) grow poorly." [25-27]*

**Response:** This sentence has been deleted from the SEIS.

## Distribution Across the Range

**Comment:** *Was the 2002 disease mapping on the South Fork of the Coquille River drainage, Powers Ranger District, part of the GIS data? [2-20]*

**Response:** The 2002 mapping is not included in the GIS database. This data was developed for district use on a localized project analysis and was not mapped at the same standards as the Siskiyou NF data. The South Fork Coquille mapping was never intended to be used for regional analysis of POC or the root disease data.

**Comment:** *It is not clear what items are included and the rationale for their inclusion in the private lands discussion for the North Coast Risk Region. For example, are private lands included in the data for the Coos Bay District? Are roadside surveys included in the data for private lands? [44-23]*

**Response:** There is no roadside survey data available for the private lands within the North Coast Risk Region, and therefore private lands acreage is not included in the Coos Bay BLM District discussion. A separate Private Lands in the Region section is included.

**Comment:** *The non-roadside infestations were mapped to a 200-foot wide infestation width on each side of an infested stream on the Powers Ranger District. If this mapping standard was used on all Forest Service lands, the draft SEIS overstates the number of PL-infested acres. [2-19]*

**Response:** For most of the Siskiyou Risk Region, there is a steep moisture gradient as distance from streams increases. This change in environmental conditions limits POC to a much narrower band along streams. Using a mapping standard for the North Coast Risk Region, which contains the Powers Ranger District, and applying it to other areas within the natural range of POC, would be inconsistent with local conditions and would over estimate acres of POC and PL.

**Comment:** *The Kalmiopsis Wilderness Area is uninfested except for Collier Creek. [32-5]*

**Response:** Besides Collier Creek, portions of the Chetco River drainage also are infested. Information on the SEIS maps shows most of the Kalmiopsis Wilderness to be uninfested. The uninfested POC in the Kalmiopsis Wilderness Area is shown on Map 3: *Phytopthora lateralis* and Port-Orford-Cedar by NWFP Allocation for the Oregon Portions of the Range under the Congressionally Withdrawn symbol.

**Comment:** *The Siskiyou Wilderness Area contains important stands of POC. [32-5]*

**Response:** The importance of uninfested POC stands in wilderness and elsewhere is recognized and highlighted in several sections of the SEIS, and the importance of such areas would be recognized in the implementation of Alternatives 1, 2, 3, and 6.

**Comment:** *Was the post Fiscal Year 2000 planting of POC on the Coos Bay BLM District done with resistant seedlings? [44-23]*

**Response:** The planting noted in the Coos Bay part of the Distribution Across the Range section of the SEIS was nonresistant seedlings. The SEIS has been edited to reflect this information.

**Comment:** *The pre-root disease baseline for POC should be included for the entire range of the species. This information shows that historically the highest concentrations of POC were on private and county lands along the coastal shelf from Coos Bay to Port Orford. Many of these stands had much greater than a 5% component of POC. Combinations of fire, harvest, regeneration practices, land use change, and root disease have drastically reduced the importance of mature POC on the private and county lands along the coastal shelf from Coos Bay to Port Orford. As a consequence, economic as well as disease pressure on the remaining Federal POC resource is dramatically increased, as is the importance of providing lasting protection. This extra urgency in protecting Federal POC is not evident in the SEIS. [31-4, 31-5, 31-6, 38-19(S)]*

**Response:** Historically, POC was a more prominent component across its natural range. Over the last 150 years the loss of old-growth POC due to fire, harvest, land use changes, and root disease has been especially pronounced on the private and county lands along the coastal shelf from Coos Bay to Port Orford. A 1953 description of the POC is provided in "A Natural History of Western Trees" and was supplied by a commenter:

> But from the first discovery of the big stands of timber in 1855, man and fire have assaulted it relentlessly. A disastrous fire in the Coos Bay region at an early date wiped out a vast but undetermined amount. Next, sawmills were at work, and schooner were anchoring off the rocky, harborless coast, to be loaded with Cedar logs carried by high line from the cliffs to the decks.
>
> The demand for Port Orford Cedar, as soon as it became known in eastern and foreign markets, grew swiftly and remained steady.
>
> Today [1953] 69 percent of this precious timber is in private ownership, which means that its destiny is the saw mill . . . while 15 per cent is held on the Oregon and California Railway revested grant lands managed by the Department of Interior [BLM]. Only 16 per cent is in the hands of Forest Service.
>
> The best way to see this tree of almost legendary fame is to follow U.S. Highway 101 between Reedsport and Gold Beach, Oregon.

Old-growth POC that might have survived logging interests on private lands have since been lost to urbanized land use changes and the POC root disease. For the most part, old-growth POC along the 101 corridor does not exist today. Currently, almost all old-growth POC is on Federal ownership.

**Comment:** *Did the Coos Bay area provide all of the POC timber in 1953 and why is the 1953 data for POC distribution by land ownership presented? [44-23]*

**Response:** The context for this question is not the geographic source of the POC timber. The important point is that pre-PL infestation within the natural range of POC, almost 70 percent of all merchantable POC timber, was on private ownerships and about 30 percent was on lands administered by the Federal Agencies. This is very different from POC distributions seen today, especially for larger more economically valuable trees.

**Comment:** *I have observed live POC and PL infections at the State of Oregon campground at Tahkenitch. Therefore, the natural POC occurrence may be further north than was described in the SEIS. [2-18]*

**Response:** It is believed that the POC located at the Tahkenitch Campground were planted outside of the natural range of POC and were therefore excluded from Map 4.

## Port Orford Cedar Acreage Data

**Comment:** *The SEIS does not adequately discuss locations and character of POC that survived in the Biscuit fire area. The SEIS does not recognize that POC still exists in many of those stands when it identifies the uninfested 6th and 7th field watersheds. [32-81(S), 44-25, 32-20]*

**Response:** The discussion of the Biscuit Fire in the POC Acreage Data section of Chapter 3&4 has been edited to say that if POC actually survived, or is reseeded or replanted in burned areas, the Standards and Guidelines of the selected alternative (including those defining uninfested watersheds, if PL was not previously present) would apply to them.

**Comment:** *There a discrepancy between the total infestation for the North Coast Risk Region (Coos Bay BLM and Powers RD) of 7,560 acres shown on Table 3&4-5, and the infestation of 9,447 acres cited on page 3&4-16 for the Powers RD? [2-21]*

**Response:** Review of inventory data for the Powers Ranger District shows a total of 61,014 acres with POC. Of this, 8,138 acres are infested with PL and the other 52,876 acres have healthy POC. The narrative and the appropriate tables have been modified to reflect this change.

**Comment:** *A study by Jules et al. in 2002 in the Siskiyou region shows that some Forest Service GIS mapping of PL substantially underestimated PL infections. Since SEIS projections are based on the GIS data, the SEIS projections must also be low and thus underestimate the seriousness of future PL levels. [33-10, 29-8, 33-24(S)]*

**Response:** Jules' et al. (2002) Page Mountain study area was conducted in the Siskiyou Risk Region. The SEIS does not use the GIS data in the Siskiyou Risk Region as the baseline from which the 100-year spread is calculated in Table 3&4-10. The SEIS states that, "Given some of the inherent overestimates and underestimates of the GIS mapping data, the CVS percent mortality calculation is considered more useful for projecting the long-term POC mortality in each region for each alternative."

The CVS data was reexamined, however, and the final SEIS now uses an 11 percent infestation rate as a base for projecting long-term mortality (Table 3&4-10) in the Siskiyou Risk Region.

**Comment:** *With a relatively small range, natural catastrophes such as wildland fire can have a large impact on population viability. The Biscuit Fire dramatically demonstrated this, but I find no discussion in the document of the long-term effects of catastrophic disturbances such as this. The SEIS needs a discussion of the impacts of recent and future catastrophic fires upon the current population of POC. [31-11, 32-81(S), 31-8]*

**Response:** Within the Biscuit Fire perimeter, air photo interpretation and other remote sensing applications indicate approximately half of the acres with healthy POC experienced a stand-destroying fire event. These acres were removed from the GIS database. A discussion of the likelihood of future wildland fires and their potential effects on POC has been added to the Fire and Fuels section of Chapter 3&4 and referenced in the Comparison of Alternatives section in Chapter 2.

**Comment:** *The statistical accuracy of the mapped POC data in GIS and CVS leave significant uncertainty for describing the POC population. There are few accurate maps of the extent of POC and the root disease for Oregon. [34-39, 21-3]*

**Response:** The SEIS seeks to create the most accurate map ever of POC and PL areas across the natural range of POC. While there are differences in mapping standards based on administrative unit and source of the mapping data, this effort still represents the most comprehensive effort to date to describe POC and PL locations. Appendix 5 recognizes that effectiveness and validation monitoring will continue to improve the existing mapping and increase its accuracy over time.

**Comment:** *Reporting PL infestations as a percentage of the total acreage of POC does not accurately represent the negative impacts that the infestations have on stream ecology, riparian reserves, and fisheries. [32-51]*

**Response:** The SEIS displays the PL infestations as a percentage of the total acreage of POC within risk regions to provide an overview across the range of POC. Specific impacts of PL infestations upon stream ecology, Riparian Reserves, and fisheries can be found in in Chapter 3&4 under Ecology and Plant Associations and under the Water and Fisheries sections.

## Pathology

**Comment:** *The specific bases for impacts over 100 years on high-risk sites are not clearly discussed. They are estimates and are not quantitative or science based. [2-2, 33-2, 33-7, 33-8, 33-9]*

**Response:** The percentages which are used in the SEIS to represent impacts over 100 years under the different alternatives are professional estimates made by FS pathologists with input from forest pathologists from the Oregon Department of Forestry and Oregon State University. As 100-year projections involving consideration of many highly variable factors, no claim is made that they are absolutely precise. They are believed, however, to give a reasonable estimate of the relative impacts associated with each of the alternatives in terms of ranking and magnitude, and provide a realistic framework for comparing alternative effects. Additional clarification of the reasoning used in making the estimates has been added to the SEIS.

**Comment:** *The possibility of all innoculum dying naturally over time on an infested site allowing such a site to be recolonized by healthy POCs is not discussed. [2-13]*

**Response:** This possibility is not discussed in the document because, although it may happen, it is likely infrequent and only occurs under fairly unusual circumstances (for instance, when all the trees in a high-risk area are killed very rapidly by the pathogen and there is a several year period before POC seeds back). There is not enough evidence for the SEIS to speculate about this possibility, but it might need more evaluation in the future.

**Comment:** *Seasonal road closures, are difficult to administer, expensive, and are not always respected. Rain during the periods when the roads are open may render them ineffective. They are not nearly as effective as permanent road closures in protecting POC. [2-15, 25-29, 34-32]*

**Response:** Seasonal road closures are susceptible to all of the problems listed. Their effectiveness is influenced by how well they are designed and located, how stout the gates or structures used are, and how well they are administered. Maximum effectiveness of seasonal closures involves use of barriers that are resistant to vandalism, are sited in locations where they cannot be bypassed, and that are carefully monitored and closed whenever rain events of sufficient magnitude to foster PL spread occur. Permanent road closures are more effective than seasonal road closures and are preferred when they can be used. The difference in effectiveness between the two types of closures is discussed in the Pathology section. However, even with their shortcomings, seasonal road closures greatly decrease road use relative to the amount that would occur if roads are open and unobstructed at all seasons of the year. They certainly reduce probability of spread relative to no treatment.

**Comment:** *Many currently-used management activities lack hard evidence of effectiveness and are perceived to be ineffective. What are the treatments? How well do they really work? Which are the best? Where are the monitoring results? Have they been looked at over a variety of habitats? Roadside sanitation and vehicle washing in particular seem questionable. [4-2, 25-5, 25-23a, 29-7, 29-14, 32-16, 32-35a, 32-75, 33-13, 33-16, 33-17, 33-23(S), 34-31, 37-2, 38-5, 38-18, 43-77(S)]*

**Response:** Many results of effectiveness monitoring and other evidence that control measures will be successful were not well covered in the SEIS. Additional discussion has been added to the SEIS.

**Comment:** *Differences between high–risk and low-risk sites are not well documented. There are no risk maps for Oregon evaluating the probability of introduction of PL. [21-6, 33-3, 33-4]*

**Response:** High-risk sites are areas with conditions favorable for spread of waterborne PL spores. High-risk areas were defined for this SEIS as low-lying wet areas that are located downslope from already infested areas or down hill from sites where future introductions could occur, especially areas below roads. They include streams, drainages, ditches, gullies, swamps, seeps, ponds, lakes, and concave low-lying areas where water collects during rainy weather. Low-risk sites are those that do not fit the criteria for high-risk sites. They include upland sites, sites on convex slopes, sites above the high water mark of streams, and areas away from roads. Detailed plant association-level risk maps for POC do not exist for Oregon. The estimated extent of high-risk areas for PL infestation in Oregon considered the area within 50 feet of roads, streams, and water features in all areas where mapping showed that POC occurred.

**Comment:** *How long can PL really survive in soil? The EIS misinterprets data on survival of PL. [25-23b, 33-18]*

**Response:** Hansen and Hamm (1996) examined long-term survival of POC and found that: (a) PL could not be isolated directly from any POC dead for more than 2 years, (b) the pathogen was recovered by baiting from litter bags after 5 years but not after 6 years, and (c) the pathogen was recovered by baiting of root systems in buried pots for the entire 7 years of the study, though recovery was sharply reduced in the last year. The wording in the SEIS has been changed to read that PL has been shown to survive for at least 7 years under ideal conditions. Hansen and Hamm indicated that PL survival was considerably influenced by temperature and moisture and was much shorter when warm, dry conditions prevailed than when conditions were cool and moist.

**Comment:** *Research by Jules et al. was improperly dismissed in the draft SEIS. The importance of roads as avenues of spread were not given sufficient weight, and distance of potential spread down a stream was dismissed with an unsupported speculation. [29-5, 29-10, 32-36, 33-14, 33-15, 34-44]*

**Response:** The research of Jules et al. (2002) was not dismissed. It is an useful study. The study used a dendrochronology approach to determine the probable way in which PL was introduced into and subsequently spread within four adjacent watersheds. Its results tally with other investigators' information indicating that PL is introduced into areas on vehicles traveling on roads and that streams often are infested at points where roads cross them. It also indicates that animal or human foot traffic are probably responsible for considerable within-basin transport of PL. The Jules et al. paper was cited in the SEIS as one of the papers indicating that transport of infested soil on vehicles is the major means of long distance spread of PL. The SEIS analysis also agrees that where it can be used, exclusion of vehicles provides more protection to uninfected POC than any other single approach. Jules et al. indicates that the maximum distance that they observed between a presumed dispersal source (a road crossing on a creek) and the first dead tree that they detected down stream in a creek was 165 meters. They also indicated that spore dispersal in flowing water most likely follows a diminishing function with distance from a source controlled by the rate at which spores settle in water. Analysis in the SEIS, however, suggests that a dendrochronological approach may make it difficult to be sure that you are in fact detecting the first tree that is infected in a creek, especially if the initial infection was many years before. Small trees and especially seedlings that may have been closer to the dispersal source and acted as intermediate spore producers are no longer detectable in such cases. Nevertheless, the SEIS indicates that spread to a first POC that is well down a stream is possible as Jules et al. suggest, though the probability is considerably smaller than spread to a first tree that is close to a dispersal source.

**Comment:** *The draft SEIS assumes a mortality rate of 0.1% per year on all low-risk sites. It concludes that there will be no differences among alternatives in impacts on low-risk sites. These are questionable statements. [31-1a, 31-10, 33-5, 33-6]*

**Response:** Many observers have reported that levels of POC mortality attributed to PL on low-risk sites is very low or appears to be absent altogether (Goheen et al. 1999; Harvey et al. 1985; Hansen et al. 2000; Kliejunas 1994; Roth et al. 1987; Zobel et al. 1985). Unfortunately, there are no published studies that have evaluated amount of POC mortality on low-risk sites, especially over time. The estimation of 0.1 percent per year is based on personal observations and professional judgements of of Agency pathologists, and it is meant to be an average.

Though levels are very low, especially compared to mortality levels in high-risk areas, there is certainly variation in amount of POC mortality on low-risk sites. Higher levels of infection surely occur near the boundaries between low-risk sites and infested high-risk sites, and lower levels of infection occur where POC in low-risk areas occurs at long distances from such boundaries. Alternatives 1, 2, 3, and 6 would reduce the amount of roadside inoculum near low-risk sites to varying levels and regulate or curtail human activity associated with bough collecting and harvest of other special forest products that could involve foot traffic from infested high-risk onto low-risk sites. The probability of PL-caused mortality in low-risk sites would be slightly less under these alternatives than under Alternatives 4 and 5, and this is now indicated in the SEIS. The assumption that mortality on low-risk sites will be completely replaced by natural regeneration and growth has been modified to say "partially," and a footnote has been added to the table showing 100 years infested acreage predictions to indicate the predicted 0.1 percent per year predicted mortality on low-risk sites is not included.

**Comment:** *The assumption that vehicle use in the next 100 years will remain at about the same level as it has been in the last 50 years is unrealistic. There is a very real possibility of increased forest use associated with increasing human population, harvest pressures, and associated changes in land use allocations. [31-1b, 31-9, 31-10]*

**Response:** There is, of course, uncertainty about what will happen in the next 100 years. The analysis in the SEIS assumes that overall level of vehicle use would be the same as in the past 50 years, but suggests that there will be changes in the kind of use with a much higher proportion of it involving recreationists and small forest products entrepreneurs rather than timber harvesters. The level of use in the last 50 years has been high, and the SEIS assumption is that it will remain high over the next 100 years. If use substantially changes, PL spread could be affected. Such a change would be reflected in monitoring, and the selected strategy can be reconsidered as needed.

**Comment:** *The ecological and economic significance of POC has been seriously impacted by root rot and human activity. Unless deliberate actions are taken to reverse the course, the pathogen will cause the functional extinction of the species. [31-2, 32-11, 32-13]*

**Response:** It is generally agreed that PL will not cause the extirpation of POC because many POC will survive on low-risk sites and because POC is an extremely prolific seed producer starting at a fairly young age. On infested high-risk sites, POC usually continues to seed and maintain some level of presence on the site, even though chronic PL infection insures that trees never live to attain large size. However, PL has had considerable impact on POC, especially on high-risk sites where conditions are particularly favorable for the pathogen and disease management actions were not taken in the past. Without the analysis, however, it is premature to say to what degree the root disease has impacted POC's ecological and economic significance. The analysis in the SEIS attempts to quantify the impacts of the various alternatives so the decision-makers can select the alternative that most efficiently meets the Need for the maintenance of POC as an ecologically and economically significant species on BLM and NF lands.

**Comment:** *The draft SEIS discusses the risk of PL spreading from Oregon to California but not spread from California to Oregon. It is not clear why the latter is not a concern. [32-18]*

**Response:** There is no biological reason, under the proper conditions, why PL could not spread from infested sites in California to infect POC in Oregon. From the pathology perspective, this possibility is a concern and has been considered in the predictions of 100-year spread. The SEIS assumes the existing management direction for the administrative units in California (see Appendix 3) applies across the range of alternatives in the SEIS.

**Comment:** *The statement that a remote area on the Little Chetco River became infested in an unexplained manner is questionable. The pathogen must have been introduced on vehicles using the mining claim road that runs into the Wilderness in this area. [32-22]*

**Response:** A team including forest pathologists from the FS and Oregon State University visited the Little Chetco River in August 1995 to attempt to determine how and where PL was introduced. The point of origin of the infestation, as determined by locating the highest point with infection of POC in the drainage, was on a tributary of Hawks Creek (at T. 39S, R.10W, Sec.14, NW ¼), a rugged area with no trails or roads. The team hiked to the Chetco River from Baby Foot Lake, walking most of the way on the mining access road to the Emily Cabin. Although they noted numerous POC in wet crossings and seeps, they found no evidence of PL infection or POC mortality along the road. Mortality and confirmed infection by PL were only observed on hosts in the channels of Hawk Creek and the Little Chetco River below the apparent origin point. There was some evidence of old logs having been cut in the stream area near the origin point and there was speculation based on District reports that a portable gold mining dredge had been used in the stream. There was also record of a fire suppression effort uphill from the point of origin, but fire fighting was not considered to be a likely cause of disease introduction since the fire occurred during hot summer weather, no water was brought in to fight the fire, fire crews accessed the site on foot, equipment was packed in by horses, and evidence of POC mortality involving large trees quite some distance down stream was observed only days after the fire had burned. The team felt that the means of introduction of PL in the Little Chetco area could not be determined and remained unexplained. Direct spread down the mining road by contaminated vehicles had been suspected but, on examination, appeared unlikely.

**Comment:** *The draft SEIS does not adequately discuss cumulative effects of off-highway vehicle use in spread of PL nor does it provide information on cumulative effects of logging and other activities on private land. [32-35b]*

**Response:** The discussion of off-highway vehicle use in the Recreation section has been expanded and then referenced in the Pathology section and considered in the 100-year PL spread predictions. Such use is part of the assumption about future activity levels. Logging on private lands is discussed in the Timber Harvest on Private Lands within the Range of Port-Orford-Cedar section early in Chapter 3&4, and is also considered in the 100-year PL spread predictions.

**Comment:** *Given the primary purpose and need to maintain POC as an ecologically and economically significant species on Federal land, the draft SEIS does not explain how other uses such as off-highway vehicle use, timber sales, and special forest product gathering can continue at their current levels and POC be protected at the same time. [32-44]*

**Response:** The alternatives include a range of PL control measures from no control (Alternative 5), to the application of various mitigation measures applied to the current level of activities (Alternative 1), to applying mitigation measures including redesign or cancellation of projects (Alternative 2), and finally to alternatives that identify uninfested areas in which many management activities are prohibited (Alternatives 3 and 6). The analysis indicates how well each of these alternatives lessens the spread of PL and what benefits that lessening has to ecological and other functions of PL.

**Comment:** *The SEIS should make spatially specific identifications of high-risk areas and identify protection measures. The best way is to expand the protected watersheds and core areas identified in Alternative 3. [32-66]*

**Response:** High-risk areas are low-lying wet areas that are occupied by POC and are located downslope from already infested areas or downhill from sites, especially roads, where future introductions could occur. They include streams, drainages, ditches, gullies, swamps, seeps, ponds, lakes, and concave low-lying areas where water collects during rainy weather. There are no detailed maps showing exactly where all individual high-risk areas are in Oregon, though their locations can be approximated by overlaying a map of streams, roads, and water features on the map of POC occurrence. In terms of managing POC root disease, some alternatives focus on protecting yet uninfested high-risk areas. The 162 uninfested 7th field watersheds identified as POC core and buffer areas in Alternative 6 and as special emphasis areas in the risk key in Alternative 2, contain a high proportion of the yet uninfested high-risk areas in Oregon. Alternative 3 contains a smaller, but still substantial portion of uninfested high-risk areas in the POC cores and buffers of its 31 uninfested 6th field watersheds. Under any of these alternatives many of the uninfested high-risk areas with POC would receive management emphasis.

**Comment:** *The draft SEIS ignores the risk of infection during storm events on upland low-risk sites. There are very high soil water content and water movement in upland areas during storms. [34-35]*

**Response:** Infection of POC requires very wet conditions and the presence of PL inoculum in the immediate vicinity of a host’s roots. While storm events can result in very wet soil conditions on low-risk sites, there is usually no PL inoculum. Most PL inoculum is spread in flowing water downhill from introduction points and is channeled into drainages and especially streams. It tends to be very much concentrated in high-risk sites, and very seldom moves uphill to low-risk areas. When infection of POC does occur in low-risk sites, it primarily involves movement of inoculum in soil clinging to the feet of animals or humans, or on vehicles that are being driven across country. When inoculum is deposited in the vicinity of a POC root by one of these carriers during very wet conditions infection can occur. POC on low-risk sites can be infected by PL, but at very low frequency, especially compared to rates of infection on high-risk sites.

**Comment:** *The draft SEIS discloses the fact that PL has four spore types but discusses only two of them and offers an unsupported conclusion that two of the spore types are not important for spread of POC root disease. [34-40]*

**Response:** The other two spore types are zoosporangia and oospores. Zoosporangia (also sometimes just called sporangia) are thin-walled sacs that form at the ends of mycelial branches. In some species of *Phytophthora*, these zoosporangia can be broken off the mycelia and blown in wind or spread in water. These are called caducous sporangia. Wind dispersal can result in rapid, wide-scale spread completely across a landscape. There is no evidence that PL forms caducous sporangia in nature, and the observed spread of PL clearly occurs via water and roads with no evidence of wind involvement. The oospore is the sexual stage of a *Phytophthora*. PL is homothallic and, in the laboratory on special media, occasionally produces oospores without involving two mating types. Oospores like chlamydospores can survive for considerable lengths of time and then, when conditions are right, germinate to form mycelia, sporangia, or zoospores. Oospores of PL have not been found in nature. If oospores do occur in the forest, they would function as long-term resting spores, that could, like chlamydospores, be involved in long-distance spread in soil.

**Comment:** *The draft SEIS indicates that there is very little spread of PL during the dry summer months but does not take into account the risk associated with rain storms during the summer. What about puddles or seeps on or along a road? [32-21, 34-41]*

**Response:** PL requires several hours of very wet conditions to infect a POC root. The likelihood of this occurring during the dry season is much lower than during the wet season of the year, but summer rain storms certainly can occur. The new Management Practice 15 in the SEIS (applicable to Alternatives 2, 3, and 6) seeks to address this concern by applying a permit or contract clause requiring project cessation of operations when conditions such as puddles in a roadway, water running in roadside ditches, or increases in soil moisture (as measured by moisture meter or the equivalent) indicate an unacceptable increase in the likelihood of spreading PL. Management Practice 9 lists road design and improvement features such as surfacing, removal of low-water crossings, and use of drainage structures to divert water away from roads that should be considered when dealing with wet spots or seeps on or along roads.

**Comment:** *Permanent closure of logging roads is by far the most direct and effective way to stem spread of PL. [33-22(S)]*

**Response:** The SEIS analysis shows that vehicle exclusion is the most efficient single way to prevent spread of PL. Closure of roads of any kind that enter uninfested high-risk areas is highlighted in the POC management strategies of Alternatives 1 and especially Alternatives 2, 3, and 6 in the SEIS.

**Comment:** *The draft SEIS gives equal weight to closing roads and not building roads at all for providing protection to POC. Isn't the latter more effective? [34-42]*

**Response:** Yes, but the difference is too subtle to show up in the ranking system discussed. Where possible, the option of not building a road at all into an uninfested high-risk area would be more effective than closing an existing road. In cases where a road already occurs in an uninfested high-risk area, closing the road will provide better protection than other options. The more completely the closed road can be blocked and/or obliterated, the better.

**Comment:** *The draft SEIS assigns a numerical risk rating to all factors except number of potential transport events. Won't this result in serious bias? [34-45]*

**Response:** The SEIS indicates that number of potential transport events should be considered in a cumulative effects analysis. However, no formula is supplied for how to do this. Certainly, if all else is equal, more potential trips increases probability of a successful introduction. Careful consideration will need to be given, however, to determine how to incorporate number of trips when comparing scenarios including different points of origin, types of potential carriers, weather conditions at the time of transport, and different types of carriers.

**Comment:** *The draft SEIS offers numeric probabilities of introducing PL without giving time frames or per unit context. [34-47]*

**Response:** The probabilities given in the SEIS are the relative probabilities that a given potential introduction event (a trip by a possible carrier) will result in deposition of viable PL inoculum along or at the end of the route taken during the timeframe of the particular trip, and that the inoculum will successfully infect a POC.

**Comment:** *Describe and rank the carriers of PL and focus management on the most effective prevention measures. [34-54]*

**Response:** Carriers are listed and essentially ranked in the section entitled Type of Carrier in the SEIS. Other factors such as route of carriers, weather at the time of carrier activity, and distances traveled, must be considered in determining the most effective prevention measures. Requiring management to focus on particular measures, however, would ignore the variable of individual sites. There are various conditions where almost any of the mitigation measures might be the best.

**Comment:** *The Agencies did not consider the likelihood that soil imbalances and particularly detrimental impacts of chemicals may predispose POC to root disease. [36-1, 36-2, 36-4]*

**Response:** There is no evidence that susceptibility to infection by PL or subsequent disease development is influenced by soil chemical imbalances. Rather, if PL inoculum is introduced in favorable high-risk sites where wet, cool conditions prevail, POC are infected on all kinds of areas irrespective of soil type or condition. In their range on Federal lands, POC have been infected on many sites where chemical fertilizers, herbicides, insecticides, or fungicides have never been used or have not been used for at least a decade prior to the infection event.

**Comment:** *Could alder planted in association with POC protect the tree from root disease? There is evidence that alder protects Douglas-fir from root disease. [36-3]*

**Response:** It was once postulated that the severity of laminated root rot, caused by the fungus *Phellinus weirii*, was less on Douglas-fir in areas where that host was growing in association with red alder than where it was not. Subsequent research has cast doubt on the validity of this hypothesis, although removing all susceptible Douglas-fir and growing a rotation of alder (which is immune to *P. weirii*) on an infested site is a recommended treatment. There is no evidence that POC growing with alder are less susceptible to PL than hosts that are not growing with alders. PL and *P. weirii* are two very different pathogens with substantially different modes of action.

**Comment:** *The draft SEIS states "the progressive mortality of POC from an introduced pathogen that seems destined to spread over much of the range of POC" is inevitable under current management programs. The draft SEIS should place more emphasis on preventing spread of the disease to healthy trees. [38-2]*

**Response:** The actual quote is: "The disease appears destined to eventually spread to high-risk areas over much of the range of POC regardless of efforts to contain it." The statement captures the point that there is no way to prevent all spread, because some spread processses are outside the exclusive control of the Agencies. On the other hand, it did not intend to imply "all" high-risk areas, so the word "many" has now been inserted before "high-risk areas." The statement is not the Pathology conclusion, but the lead-in to the Need section to help focus the alternatives both on the need for, and the limitations of possible control strategies. In reality, the alternatives are variously projected to keep PL from spreading to a portion of a high-risk area, at least for the foreseeable (100 years) future.

**Comment:** *Permanent closure of logging roads is by far the most direct and effective way to stem the spread of PL. Long distance spread of PL needs to be investigated and the reasons for it simply eliminated, whether it be mining activity, bough collecting, or the transport of contaminated equipment. [33-22(S), 44-29]*

**Response:** Long distance spread of PL involves movement of infested soil from areas with diseased POC to areas with healthy POC, and vehicles are indeed the carriers in most cases. Animals and humans on foot also can act as carriers, but spread attributed to them is usually over relatively short distances. They are important in transport within a drainage, but are unlikely to act as carriers between drainages. All kinds of vehicles can serve as long-distance carriers, not just those used in mining, bough collecting, or timber harvest. Eliminating all vehicle activity within the entire range of POC in Oregon would not be an easy matter and is not desirable to many people. A strategy that protects POC in key uninfested high-risk areas and decreases likelihood of inoculum spread along roads in other areas seems more viable.

**Comment:** *Is it possible to predict which size trees will be hardest hit by the disease under each of the alternatives? [44-28]*

**Response:** Host trees of all sizes will be infected and killed on high-risk sites at times when favorable environmental conditions prevail and PL propagules contact their roots. Large trees take longer to die than small trees. There may be up to 4 years between infection and death for POC over 30 inches diameter at breast height while small POC (seedlings and saplings) may die in as little as a month or two after infection. The different alternatives will differ in the likelihood of inoculum being introduced into high-risk sites, not in the size of hosts impacted on those sites if an introduction does occur.

**Comment:** *Is use of chlorinated water necessary for fire suppression activities since the* *pathogen is not heat resistant? [44-31]*

**Response:** Use of chlorinated water or water from a source that is known to be uninfested by PL is preferred for wildland fire operations in areas where POC occurs. In firefighting efforts, not all water used actually falls directly into the flames where it might be heated sufficiently to kill the pathogen. There is also the possibility of water spilling from helicopter buckets on the way to a fire. Use of chlorinated or clean water is considered under the current management direction prudent to avoid accidental PL introductions.

**Comment:** *What percentage of the Inland Siskiyou is infested with PL now? How do the percentages in the text at 3&4-33 and 34 compare with those in Table 3&4-9? The text appears to reflect the vegetation survey rather than the GIS data. [44-27]*

**Response:** The text reflects the current vegetation survey data because that is the data used to make the 100 year projections.

**Comment:** *Disease projections in acres are based on disease percentages on CVS plots that are done by tree frequency. Such an approach would overestimate PL infestations; GIS or other <u>acres</u> should be used to make future projections of infested <u>acres</u>. In the large amount of field verification work that I have completed, I have observed smaller dead trees not detectable on aerial photos but the amount of area they represent is small. In addition, the sample or database of aerial photos is continuous rather than the 1/7 mile grid of CVS plots. [2-23]*

**Response:** The CVS plots represent a recent random sample that includes trees of all size and location across the landscape. For this reason, it was considered as a generally better representation of the percent of infested trees, and therefore acres, than Agency maps. There might be a concern if smaller trees were more likely to die from PL and therefore represent more acres than actually infested, but such is not the case. The Pathology section indicates that, if anything, larger trees are more likely to be killed.

**Comment:** *The spread rate would vary not only by alternative but also by area (ecological conditions) and density of POC. [2-3]*

**Response:** The differences in spread rate by risk region are reflected in the amount of each region deemed high risk. There is not an observable difference in spread rate or susceptibility dependent upon stocking level.

**Comment:** *The "integrated management" portion of the Pathology affected environment section is far too optimistic and assumes every manager would magically choose a combination of practices that would reduce risk almost to zero. [34-43]*

**Response:** The section does describe one assumption, or circumstance, used by the Pathology effects authors in their overall estimates of disease spread for the various alternatives. Its likely effectiveness and use were estimated by the Pathology section authors according to the language of the Standards and Guidelines in each alternative, rather than assuming it would be applied maximally in every situation until the risk is zero. No action reduces the risk almost to zero, and no alternative is predicted to achieve zero PL spread.

The Pathology section has been edited to include effectiveness information for all of the

Management Practices listed above and below the risk key in each alternative. The "integrated management" discussion in this section provides additional information to managers about the effectiveness, or synergy, that can be achieved by applying two to several of the Management Practices where they are applicable. For this use, this section can best be described as a source of information for managers considering what, and how many, Management Practices to apply to best reduce the risk.

## Ultramafic Soils

**Comment:** *The SEIS should address issues including secondary benefits that may result from actions to control PL. For instance, closing roads can help reduce erosion. [43-79(S)]*

**Response:** Indirect, or cumulative benefits of the various Standards and Guidelines are included in the various resource element discussions. For example, the benefits to water quality of closing roads is discussed in the Water and Fisheries section. The reduction of noxious weeds from vehicle washing is documented in the Botany section. A more detailed summary of cumulative effects appears early in Chapter 3&4.

**Comment:** *In the Ultramafic Soils section of the draft SEIS, the Agencies claim that none of the alternatives will have any major effects to soils. The draft SEIS states that POC's ability to utilize soil calcium does not enrich soils, and although litter fall places calcium in a more usable form and location for other plants (Zobel et al., 1985), the effect is small (Powers, personal communication). The underlying data or scientific evidence for "professional judgment" claims such as this must be disclosed in the draft SEIS. In addition, the soils section fails to disclose that POC's rot resistance helps prevent erosion and maintains soil moisture. In addition, the SEIS fails to disclose that litter and soil under POC are less acidic (have a much higher pH) than those under other conifers, and that this may have distinct effects on soil properties. (Zobel et al., <u>Ecology, Pathology, and Management of Port-Orford-Cedar</u>, GTR PNW-184, Sept. 1985). The capacity for other trees to grow on some ultramafic sites may result from the influence of POC on the soil. (Id.) [32-29]*

**Response:** The Ultramafic Soils section of the SEIS has been rewritten to address the issues that were raised with this comment. There is little scientific information concerning the direct relationship of POC and ultramafic soils. There is no scientific evidence that POC has the ability to enrich soil calcium on ultramafic soils, or that decaying POC helps prevent erosion or maintain soil moisture. Soil acidity is lower on ultramafic soils compared to other soils whether POC is present or not. The capacity of other trees to grow on ultramafic soils as a result of POC is also unknown.

**Comment:** *The draft SEIS minimizes the beneficial effect of POC on soil calcium cycling (p 3&4-82). The draft SEIS says that POC litter-fall makes calcium available in a form and location that may be beneficial to other plants. The draft SEIS does not seem to recognize that since POC is often the dominant overstory tree in ultramafic settings and it is not readily replaced by other large conifers, the calcium-bearing litter-fall provided by POC is of a magnitude that is unmatched by other plants. To that extent, it is unique and irreplaceable. [34-50]*

**Response:** The Ultramafic Soils section of the SEIS has been rewritten. There is no scientific information showing a direct relationship of POC with calcium cycling on ultramafic soils.

**Comment:** *The draft SEIS does not adequately consider the value of POC in providing slope stability and mitigation of landslide risk. The draft SEIS must disclose the possible consequences of increased mass soil movements if PL is not prevented. [34-25]*

**Response:** When POC is abundant on ultramafic soils, it is usually near seeps, springs, and streams. The indirect impact of POC mortality on soil streambank stability is discussed in the Water and Fisheries section of the SEIS.

### Ecology and Plant Associations

**Comment:** *POC is an important ecological component in many watersheds where its ability to survive on poor soils often results in this species being the only large component on the landscape. Mitigation by a disease resistance program will not be able to replace the ecological function that is provided by large old POC trees for many years, and it is still not known how successful disease resistance breeding may actually be in the long term. [4-4]*

**Response:** Under all alternatives the amount of POC is expected to decline over time. Complete elimination of effects of PL on POC is not practical by any known mitigation or control measure. Uncertainties about the resistance breeding program are described.

**Comment:** *It is obvious from the literature that POC is an extremely important element of our biodiversity, and it is in jeopardy due to POC root disease. In order to manage for functional ecosystems (Manley et al. 1995), the FS and BLM need to develop a conservation strategy that will insure its continued existence as an element of biodiversity. The Agencies appear to be choosing to ignore one of the key factors in the management of POC, the maintenance of its extremely high biological diversity (Atzet et al. 1996; Jimerson 199b; Jimerson and Creasy 1991; Jimerson and Daniel 1994; Jimerson et al. 1995; Jimerson et al. 2000; Jimerson et al. 1999). Clearly, managing for the maintenance of biological diversity is called for in NFMA (Section 6 B) and should be the driving issue in this EIS. [21-2, 32-74(S)]*

**Response:** The alternatives can each be thought of as conservation strategies for managing the continued existence of POC. They differ in their efficacy for meeting this need. Effects on maintaining the amounts, by plant association group, of POC are clearly articulated in Ecology section of Chapter 3&4.

**Comment:** *Little or nothing is said about maintaining the ecological and genetic diversity of POC (Jimerson and Creasy 1991, Millar and others 1991). These are the two most important aspects of maintaining POC across the range of the species. [21-16]*

**Response:** The Ecology and Plant Associations section of Chapter 3&4 has been rewritten to more clearly show the relationship of the alternatives to their effects on the diversity of POC ecosystems. Numerical inconsistencies in the Ecology section of the SEIS have been corrected. The Ecology section addresses structure, function, and composition of POC ecosystems at the relevant scales for the Purpose and Need of the SEIS.

**Comment:** *In the Intensively Evaluate Individual Plant Association Group (PAG) Sites and*

*Implement PAG-Specific Management Criteria alternative in the Alternatives Considered but Eliminated from Details Study section of Chapter 2, the SEIS states "…analysis has determined that PL will not completely eliminate POC from any PAG…" This and similar statements seem to be used to justify doing less than is feasible to protect POC, and seem to imply that so long as POC does not go extinct, the need has been met. I agree that POC probably will not go extinct throughout its range due to PL. I doubt that all PAG's will retain POC over time, given no effective management of PL. Preventing extinction, in any case, is far from fulfilling the stated need. The stated need is appropriate, but in many places the document seems to confuse that with preventing extinction. [25-16]*

**Response:** The explanation of this alternative that was considered but eliminated is that it would ". . . identify representative samples for each of the 90 PAGs . . . ", and protect some of each to have a sample. This "sample" aspect of this alternative would not necessarily meet the Need for maintenance of ecological significance, and is therefore not analyzed.

**Comment:** *The "Spacing objectives" for thinning in Alternative 2 are not conservative enough (why must POC populations be discontinuous?) [44-16]*

**Response:** Using thinning to effectively disperse POC (thus creating discontinuous populations) could lead to slower rates of infection and spread of PL. In natural stands POC often occurs in mixtures with other species, so thinning could lead to an approximation of this natural distribution.

**Comment:** *Table 3&4-12 has a significant typographical error. "% of total infected" should read "High risk as % of total", comparing the data to Table 3&4-17. Also, the last vertical colum [sic] should be labeled the same in the two tables, probably "East Disjunct" since the broader category is "California". [44-30]*

**Response:** Tables in the Ecology section of Chapter 3&4 have been corrected.

**Comment:** *The draft SEIS should have disclosed the Forest Service's obligations to protect diversity pursuant to NFMA and its implementing regulations. The proposed action does not satisfy these obligations. [32-7]*

**Response:** Chapter 1 has been revised to show compliance with all applicable laws to be part of the Purpose statement. Effects of the alternatives on diversity are disclosed in the SEIS, particularly in the Ecology and Botany sections.

**Comment:** *The draft SEIS fails to assess the fact that mature and old-growth POC will be eliminated in infected areas, and that other types of downed woody debris do not last as long in the water and on the ground (this is particularly important for fisheries, providing long lasting downed woody debris to stream systems), especially in ultramafic ecosystems. [32-14, 32-24, 32-80(S), 32-47, 21-19]*

**Response:** The Ecology and the Water and Fisheries sections have been edited to reflect this comment.

Replacement of POC snags and logs by other species depends on the particular POC ecosystem. Some POC communities in the ultramafic riparian group do not feature other conifer species and may become dominated by shrubs if the POC canopy is lost. Most other POC communities include Douglas-fir, white fir, Jeffrey pine, or other overstory conifers. In the larger-size classes, these species could be expected to provide wood to streams, although their wood will not last as long as that of POC.

Because POC wood is exceptionally resistant to decay, POC logs could be expected to contribute to stream function for a considerable amount of time. Storm events in the high-gradient streams of this region, however, could result in the logs moving downstream (Mellen, K., *personal communication*).

Based on research and monitoring data, dead POC trees cannot be expected to fall over quickly. Jules et al. (2002) documented uninfected POC snags still standing up to 200 years since their death. Monitoring data from the Agua-Stimpy project area (Medford BLM District, Grants Pass Resource Area) shows no infected POC falling over. This area has been infected since the mid-1970s (Betlejewski, F.B., *personal communication*).

On many POC riparian sites a lag time can be expected where alder, tanoak, or other pioneer hardwood species invade openings. Alder and other hardwoods will sometimes provide shade over streams within 3 to 5 years of colonization. Hardwoods, as they mature, are less desirable as downed material for stream function because they are often of smaller diameter than conifers and do not last as long. Whether conifers eventually become established in these streamside areas depends on site conditions and disturbance history.

**Comment:** *In Chapter 3&4, Riparian Effects section, it states that "…[the loss of POC] would be least deleterious in the Northern Coast, where western red cedar may be able to fulfill some of the downed wood role. Western red cedar is not abundant on the other geographic areas." Thus, the draft SEIS Water and Fisheries sections concludes no impact to fish based on speculation about western red cedar's potential ("may be able to") to replace the downed wood function of POC. Even if western red cedar does replace dead POC along streams many generations of salmonids, including coho salmon, would experience less than optimum conditions because the western red cedar would take decades to hundreds of years to attain the size and optimum function of old-growth POC. [32-52]*

**Response:** Western red cedar cannot be expected to replace POC in most cases. The statement in the draft Ecology section on red cedar has been corrected, and related edits to the Water and Fisheries section have been made.

**Comment:** *The assumption that mortality on low-risk sites will be replaced by regeneration or increased POC growth is not supported by evidence. Along some high-risk roadsides POC does regenerate, and mortality appears to be replaced by regeneration, although the average stand age seems to be held constant by the mortality. Away from roads, however, I believe that available evidence suggests that POC regenerates effectively only after certain disturbances. The tree can produce seed at a relatively young age, when open grown. It grows more slowly than most associated species, and is quickly overtopped. Trees continue growing slowly, but reproduction appears to be essentially nil. There is little or no data to support any assumptions about POC population dynamics in young stands. [31-10]*

**Response:** The assumption has been modified to say "at least partially" replaced. Regeneration and young stand development of POC are detailed in Zobel et al. (1985). Growth varies greatly depending on plant community (a reflection of site conditions). In clearcuts POC was found to grow favorably compared with other conifers, at least until it reached breast height. Around age 20 to 25 years POC is usually overtopped in mixed stands.

**Comment:** *Describe the Port Orford Cedar species and its role in the ecosystem, with special attention to riparian areas, ultramafic soils, and fire-adapted ecosystems. [43-75(S)]*

**Response:** POC in riparian areas and on ultramafic soils was detailed in the Ecology and Plant Associations section of Chapter 3&4. A discussion of fire and its effects on POC has been added to the Ecology and Plant Associations section.

**Comment:** *There are now many publications and documents that discuss the ecological and cultural values of Port Orford cedar and its habitat.*
*[32-77(S)]*

**Response:** Yes, this work is respected and has been drawn from in developing the SEIS document.

## Botany

**Comment:** *The SEIS needs to examine the likelihood of extirpation and extinction of endemic plants growing on ultramafic-derived soils if the PO cedar is no longer there either due to root rot or "sanitation" logging. [27-2]*

**Response:** The potential for endemic plants being extirpated and becoming extinct if POC is no longer present is discussed in the Biological Evaluation in Appendix 7, and in the Botany section in Chapter 3&4.

**Comment:** *The Botany section in Chapter 3&4 states that sensitive plants are in good shape, but goes on to say that these plants are threatened by grazing, mining, off-highway vehicles, fire, noxious weeds, timber harvesting, roads and fire suppression. The SEIS cites "Frost," but no other reference to that cite is found in the SEIS. The cumulative effects on sensitive plants of PL killing POC, along with these additional threats should have been thoroughly analyzed in the SEIS. [32-26]*

**Response:** The discussion in the Botany section has been clarified; the items cited can cause indirect effects, but all actions are mitigated before an activity takes place. Known populations of listed plants are always protected by project design, such as buffers, to protect the microclimate. With some impacts, like wildland fires, there is very little control. A relationship between the loss of POC and rare plant species could not be drawn; therefore cumulative effects could not be discussed.

**Comment:** *The draft SEIS fails to describe the consequences of the alternatives on the BLM and FS special status species in the range of POC. [34-53]*

**Response:** Additional discussion of the potential effects to FS sensitive species and BLM special status species (Bureau sensitive and Bureau assessment) have been added to the SEIS. The Biological Evaluation in Appendix 7 already contained discussion of these species.

**Comment:** *Baseline data regarding rare plant species distribution and abundance in the* *uninfested 6th field watersheds would greatly increase understanding of how the watersheds will provide for these plant species and what effects the loss of Port-Orford-cedar will have on rare species and ecosystems. The SEIS contains almost no information on the characteristics of the 32 6th field watersheds and how those watersheds compare to infected watersheds with respect to sensitive resources and Port-Orford-Cedar vegetation diversity. It is evident from viewing the maps that the watersheds differ widely in allocated land uses, types of access (roads or trails), traffic volume, distance to infected stands, and stakeholders interest. From these general differences, it appears that these watersheds would also vary greatly in their response to protective measures, impacts to riparian ecosystems, direct costs of protection, and direct costs in the form of foregone harvest and employment. The alternatives and analysis presented in Chapters 2 through 4 do not provide sufficient information or flexibility to allow for site-specific considerations or decisions among the watersheds. The option for decision-makers are artificially constrained by treating all of these watersheds as a collective entity. [45-1]*

**Response:** Known special status species locations were overlayed with these watersheds, and a summary of the results has been added to the Botany section in Chapter 3&4. However, it is unclear how this will aid the decision-makers in making a choice between the alternatives. First, no relationship between the loss of POC and rare plant species could be drawn from the analysis in the SEIS. There is not enough information available to connect the known rare plants within POC plant communities to those communities only. Since there is evidence of unique species benefiting from the removal of POC, additional protection for these watersheds may or may not benefit unique species in the same areas. Second, Alternatives 3 and 6 either provide additional protections for all uninfested watersheds or they do not; there is no expectation the decision-makers will choose certain watersheds. Third, most special status species surveys are project-driven, and the uninfested watersheds are, as a group, characterized by a lower level of management activity than infested areas; that is one of the reasons they are uninfested. For this reason, known (but not necessarily actual) species sites will be less prevalent in such watersheds. Fourth, protection of special status species sites will be considered at the project scale. Even under Alternative 2, the presence of special status or listed species, and whether or not they would be affected by the loss of POC, will be one item considered in the risk key.

**Comment:** *The SEIS needs to describe the wide range of secondary benefits that may result from actions to control P. lateralis: for instance, closing roads can help reduce the spread of invasive species. [43-79(S)]*

**Response:** Secondary effects of road closure/seasonal restrictions were discussed in the botanical analysis. Additional information has been added.

## Water and Fisheries

**Comment:** *Loss of POC, especially in high-risk riparian areas, will result in loss of shade, bank stability and long-term wood recruitment to the stream. The EIS should disclose how the Agencies failure to control the spread of PL will meet the NWFP Aquatic Conservation Strategy goals and objectives and the Clean Water Act. [34-16, 34-17, 34-19]*

**Response:** Stream shading response, as affected by POC that succumbs to PL, varies by risk region. In the North Coast Risk Region and non-ultramafic portions of the Siskiyou and

Inland Siskiyou Risk Regions, the Water and Fisheries section text has been clarified to show spaces in the canopy would be filled rapidly by adjacent trees broadening their canopies, release of understory trees, or seeded trees. Therefore, loss of shade that may translate into an increase in stream temperatures is not expected in these areas. The Water and Fisheries section text discloses that there would be short- to long-term decreases in stream shade in the mid-drainage and valley streams within ultramafic areas of the Siskiyou and Inland Siskiyou Risk Regions. However, this effect is variable because (1) POC in microsites set back from the stream where standing water cannot reach the trees will not be affected by the pathogen, and these POC will continue to cast shade because they tend to be tall and cast longer shadow lengths, shading the stream, except for midday; (2) species richness of POC stands with assemblages of other trees that are not susceptible to the pathogen varies; (3) the pathogen migration is predicted to be slow and in a downstream direction; upstream areas above roads would be much less affected; and (4) POC killed by PL would be replaced by Douglas-fir, Jeffery pine, western white pine, or hardwoods which would eventually increase shading. Also refer to responses to comments 32-70 and 32-48 on page A-151 for additional discussion.

Bank stability is expected to remain within the range of natural variability. This is because POC has tremendous decay resistance including large roots. The mass of large roots form a matrix that will persist for years (Burroughs and Thomas 1977) and resist the action of flowing water along streams, thus binding streambanks. In the meantime, a replacement stand would be increasing root strength. In the ultramafic soils areas, the underlying bank material includes cobble-sized rock that is very resistant to erosion, thus preventing the lateral migration of streams.

POC would have very long and variable temporal inputs to the streams as standing POC snags have been aged in excess of 800 years old (Jimerson 1999). The turnover rate of forest stands for conifer or mixed conifer/hardwood of other species would be considerably faster (expected to be in the range of 60 to 100 years for hardwoods and 80 to 300 for noncedar conifers).

Within the ultramafic soils areas, there may be a future gap in large wood recruitment for POC killed close to the stream. However this short-term lower recruitment rate is not expected to be significant because (1) durable POC material will be standing as snags on streambanks that would be future downed wood, (2) healthy POC trees not subject to infection or the influences of standing water in riparian areas should provide some contribution of POC woody material, (3) POC log structure in streams will considerably out last other tree species holding together stream structural integrity and habitat diversity, and (4) a Douglas-fir, Jeffery pine, western white pine, or red alder or tanoak replacement stand will likely begin providing large wood recruitment to streams within 80 to 200 years.

The Agencies have been aggressively implementing management actions since the early 1990s to limit the spread of the disease, including actions along roads and ditches, streams, wetlands, and in riparian areas. The SEIS indicates that the pathogen cannot be completely stopped from migrating through high-risk sites, but it can be slowed (refer to Introduction and Pathology sections).

The BLM and USFS have been addressing the four components of the NWFP Aquatic Conservation Strategy since 1994, by establishing a system of Riparian Reserves and Key

Watersheds, completing comprehensive watershed analysis, and systematically completing restoration projects. This includes many restoration projects to slow the spread of PL through high-risk stream and riparian area. Measurement of the applicability of a project compared with specific Aquatic Conservation Strategy Objectives are completed on a project by project basis and normally developed for informal consultation with the National Marine Fisheries Service for Federal salmonid listings.

The "Clean Water Act" nonpoint source sections direct the EPA through the Oregon Department of Environmental Quality (ODEQ) to periodically assess the States' water quality conditions and either list or delist stream segments that are outside ODEQ's Water Pollution Division 41 Water Quality Standards, Beneficial Use Policies and Criteria for Oregon. To be in compliance with applicable water quality criteria ODEQ, through a load allocation total maximum daily load process for point and nonpoint sources on impaired waterbodies, may require a water quality management plan or best management practices for forestry and agricultural lands. Agencies are cooperating in this effort. Many of the elements of the Aquatic Conservation Strategy including a system of Riparian Reserves and Standards and Guidelines, and restoration efforts are considered sufficient strategies that protect, to the degree feasible within economic limitations, water quality conditions in streams, lakes, and wetlands.

**Comment:** *The draft SEIS did not list ODEQ temperature limited 303(d) streams affected by PL. The DEIS failed to disclose that PL would cause the listing of additional streams for temperature. Modeling results form ultramafic streams suggest that temperature increases caused by POC infestations would either degrade currently listed 303(d) listed streams or cause unlisted streams to become listed. The DEIS did not explain what management practices may be used to recover 303(d) listed streams to current state standards. [32-70, 32-48]*

**Response:** The text has been modified to indicate the miles of 2002 ODEQ water quality limited 303(d) streams for temperature. Areas of POC infestation, uninfected sites, and ultramafic derived soils are also displayed. Intersection of the 2002 ODEQ Streams 303(d) coverage with Map 4, Port-Orford-Cedar Occurrence and Range, and performing applicable queries shows (1) presence of POC along 8 percent of identified 1,020 miles of 303(d) streams for temperature in the POC range in Oregon, (2) 3 percent of 303(d) streams for temperature are currently infested, and (3) POC presence and infestation are about equal along 303(d) streams for temperature in ultramafics and nonultramafics.

Whether the spread of PL will cause additional listings for streams is unclear, but less likely based on several factors. The listed streams for temperature are generally in lower valleys, along wide streams that cannot be fully shaded by trees or forest vegetation and receive little topographic shade. Many of these listed streams are outside Federal lands and the analysis, and receive anthropogenic nonpoint source warming from other sources besides forestry, including agricultural and point sources. In contrast, mid-valley and headwaters streams that have POC presence are in canyons and landscapes that receive some topographic shade, have narrower stream widths to be shaded, and do not have other warming sources. The POC spatial distribution and stand composition varies from scattered POC amongst other trees to stand assemblages of 40 percent or more POC. These mid-drainage and headwater streams have limited floodplains, and PL infestations by waterborne spores would only affect streamside trees; while trees standing further back from the waters edge would continue to provide shading. In the North Coast and Siskiyou Risk Region, gaps in the canopy from scattered

POC killed by PL will be filled rapidly by adjacent trees broadening their canopies, release of understory trees, or seeded trees. Gaps causing shade loss, in these regions, would not be large enough to change stream shading because of the residual canopy. In the Siskiyou Inland Risk Region POC killed by PL on the nonultramafics would have a similar shade response as the aforementioned two regions. In the ultramafics soils area, some shade loss could be expected to occur (refer to responses to comment 34-16 on page 100, and comments 34-17 and 34-19 on page A-149 for additional explanation).

The modeling results given in Appendix 9 are meant to display a worst-case scenario for temperature increase resulting form POC mortality (that is, ultramafic soils areas and a homogenous stand of POC). However, POC averages less than 50 percent of the overstory in riparian ultramafic plant associations. Although one could conclude that the modeling may indicate more temperature listings, the current modeling programs predicting shade do not allow variable stand types resulting in variable canopy densities as inputs. Therefore, the predicted loss of shade and stream warming is overestimated. The current distribution of listed streams and site factors also need to be considered. Continuous summer field monitoring is normally completed to assess a stream's water temperature profile and range of conditions. Refer to the above shade/temperature discussion and responses to comment 34-16 on page 100, and comments 34-17 and 34-19 on page A-149 for further explanation.

Management practices to address ODEQ 303(d) temperature listed streams are beyond the scope of this EIS. Normally passive and active restoration is discussed in applicable water quality management plans prepared for or by ODEQ for EPA approval. These management plans specify benchmarks and goals for water quality attainment and in some cases allow natural conditions exemptions from the basin standard, when waterbodies cannot meet goals using best available science, and cost effective management techniques.

**Comment:** *The watersheds selected in Alternative 3 should have recommendations about coho salmon streams and ODEQ temperature listed 303(d) streams needing additional protection at the seventh field drainage (1,000-10,000 acres) or lower level. [32-50]*

**Response:** A new Alternative 6 has been constructed showing 162 7th field watersheds that include 100 acres or more uninfected POC. This alternative is basically a refinement of Alternative 3 taken to the smaller drainage level. Overlaying the current ODEQ 2002 303(d) water quality streams listing for temperature shows that 24 of these watersheds involve 303(d) stream segments. Specific recommendations about ODEQ temperature listed 303(d) streams are developed though a ODEQ waterbody total maximum daily load process, and are beyond the scope of this analysis. Future Federal actions in uninfested 7th field watersheds will be evaluated for the potential of impacts to coho salmon streams. Individual project-level consultation with National Oceanic and Atmospheric Administration (NOAA)-Fisheries will tier to the plan-level consultation and management measures to minimize impacts to coho. Refer also to responses to comment 34-16 on page 100, and comments 34-17 and 34-19 on page A-149.

**Comment:** *The draft SEIS fails to assess the longevity of downed POC in stream systems, which are important for fishes. Other types of woody debris (for example, red alder) do not last as long in the water. Even if western red cedar does replace POC along streams, it would take decades to hundreds of years to attain size and optimum function. This may lead to many generations of salmonids experiencing less than optimum habitat conditions. [32-*

*14, 32-25, 32-52, 32-53]*

**Response:** POC longevity is discussed in the SEIS Water and Fisheries and Ecology and Plant Associations sections under Riparian Effects. Other types of woody debris, although not as decay resistant as POC, can last for decades to centuries depending on submergence in the water or burial by stream sediments.

Recruitment to the stream by other hardwood or coniferous species, such as red alder, tanoak, Jeffery pine, western white pine or Douglas-fir would be faster than POC because they are not as long lived. Agents of mortality or wind would spatially topple trees into streams and wet areas. These forest trees may have smaller diameters than POC. Smaller sizes coupled with less decay resistance would lead to faster depletion rates in streams. However, the forest stand would have greater numbers of smaller-diameter trees, so the treefall rate and the forest stand turnover rate would be higher. When streamside POC is killed by PL new regeneration by other shorter-lived tree species will gradually occupy the site, except in some ultramafic areas. Existing POC pieces in streams will last for decades to centuries, while new stands reach maturity. Non-streamside POC within the recruitment area, but not susceptible to infection, will continue to provide temporal and spatial inputs of POC to streams, but on a long-term basis (decades to centuries). Therefore, it is anticipated that the future wood supply to streams would include a mixture of greater amounts of smaller diameter woody debris, and some large POC pieces with variable depletion rates. Because of this forest stand heterogeneity, these changes in wood supply are still expected to maintain suitable complex habitat for fishes.

**Comment:** *The draft SEIS omits to inform the decisionmaker that controlling PL may have indirect benefits, such as better protection for coho salmon. For example, closing and decommissioning roads may reduce erosion and protect water quality from sediment failures from roads during floods. [43-79(S), 32-49]*

**Response:** These benefits are likely, particularly for winter use roads. Management measures in the risk key in Alternative 2, including seasonal and permanent road closures, and no vehicle entry in POC cores and transportation analysis and management objectives for POC buffers in Alternatives 3 and 6, would have secondary benefits. Text has been added to the Water and Fisheries section to clarify this connection between the mechanism for PL transport (see Pathology section) and the indirect benefits.

**Comment:** *The presentation of Table 3&4-18 and Table 3&4-19 are unclear. Please explain how to read them. [34-48]*

**Response:** Both tables are divided on the idea of the stream continuum starting in the upper watershed with small ephemeral and intermittent streams, and working downstream to perennial mid-drainage and valley streams. Table 3&4-18 is read from top to bottom starting from the left. Sequential attributes are shown in the left most column. The second column shows the landscape position of the stream (for example, the headwaters). The third column shows the relationship of PL to the attribute in this watershed region. This same sequence is repeated for the mid-drainage to valley streams, except the same attributes in the left most column are reused. Table 3&4-19 is read in the same manner, except instead of attributes in the left most column, the risk regions are compared.

**Comment:** *POC infestations should be reported as "perennial miles infested" or "fish* *bearing stream miles infested" because streams are linear. This would provide an accurate indicator of ecological effects to streams and riparian reserves, and would allow a comparison of alternatives by their impacts to cold water fishes (e.g., coho) and amphibians. Reporting acreage infested instead of stream miles may be giving the impression that the impact of the infestation is relatively low. The percent of infestation affecting anadromous fish streams is probably very high, especially if ultramafic geology streams are excluded. The DEIS did not estimate the miles of fish habitat in ultramafic soils that have been infected by PL, nor estimate future infections. The DEIS can not conclude that the area affected is "very limited" without making this calculation. [32-51, 32-46, 32-55]*

**Response:** Using the best available information, including BLM/USFS datasets and GIS maps, POC infestations by stream miles in the POC range within Oregon have been calculated. Because the Federal Agencies have captured the streams at differing densities, 2nd order and greater streams on BLM were used in conjunction with the USFS stream classes I, II, and III to arrive at a similar looking and comparable streams coverage. This coverage was intersected with the SEIS Map 4; Port-Orford-Cedar Occurrence and Range, to arrive at stream miles of POC presence and infestation. The text has been clarified to show that there are 295 miles of stream infestation, representing 2.5 percent of the total stream miles within the natural range of POC. There are 166 stream miles of infestation, if the ultramafic soils are excluded, comprising 1.5 percent of the total stream miles. Anadromous fish streams make up a lesser percentage of the total stream miles, because of natural barriers and unsuitable habitat in many upper reaches. Therefore, the percent of infestation affecting anadromous stream miles within the natural range of POC is actually very low (less than 1.5 percent of the total stream miles).

**Comment:** *Many headwater streams are perennial, indicated as blue line streams on USGS topographic maps, and BLM or USFS riparian stream surveys. Intermittent streams usually do not have POC. POC killed by PL in headwater areas would lead to rapid stream warming. This in turn may reduce or eliminate coho salmon populations. [32-59]*

**Response:** U.S.Geological Survey mapping normally shows only the main trunk streams and excludes the tributary feeder streams in an attempt to keep the map from looking too busy. As such, these included "blue line streams" that are normally always perennial. When the SEIS text refers to headwater streams, the meaning is ephemeral and intermittent stream channels that have a duration of flow less than all year, and are not shown on USGS maps. Potential effects to perennial streams, including effects on temperature, are addressed in the Mid-Drainage to Valley Moderately Confined and Unconfined Stream Channels section.

**Comment:** *The draft SEIS did not state that floodplains and wetlands will be affected by PL, as required by Executive Orders 11990 and 11998. The DEIS did not disclose the impacts of PL to wetlands. Landform influences on the distribution of POC have not been characterized adequately. [32-71]*

**Response:** Executive Orders 11990 and 11998 are a furtherance of NEPA in regard to an evaluation process for activities or actions Federal Agencies may take in order to minimize harm to wetlands and floodplains. Actions, including location or new construction in a floodplain or wetland are site-specific plans evaluated at a project level, where alternatives can be developed including conservation practices to minimize harm to the environment. Although the SEIS alternatives could benefit floodplains and wetlands, they do not constitute actions for purposes of these Executive orders (see also Critical Elements of the Human

Environment section in Chapter 3&4).

Due to data coverage availability and GIS analysis processes, the USFWS wetland mapping was not included in this effort. The USFWS mapping resolution is to 2.5 acres. Many wet and depressional areas associated with POC are smaller in extent and would be missed. However, the NWFP includes Riparian Reserve areas around all wetlands regardless of size and the Standards and Guidelines include specific management criteria.

Distribution of POC by landform and microsites is discussed in the Pathology section in Chapter 3&4. Any area where water collects and POC roots are present is at high risk of infection, and would be managed accordingly.

**Comment:** *The draft SEIS indicates that the effect of decreased root strength would be localized and not significantly increase slumps or entry of colluvial material into the channel. However, Table 3&4-19 indicates + (increased) episodic mid-drainage inner gorge slides partly due to the loss of root strength. Please clarify. Increased landslides would be likely to adversely affect coho salmon. [32-61]*

**Response:** The SEIS referred to intermittent streams in headwaters landscape positions. Table 3&4-19 shows regional hydrologic differences by risk region. In the Siskiyou Risk Region, a subset of the entire POC range, an effect of mid-drainage POC streamside mortality may be either no change or slightly increased inner gorge slides that seldom occur. The term *episodic* is used to mean an infrequent large precipitation and runoff event (such as a 100-year storm). Some local root strength declines in select areas may occur in the short term, but not in the long term. This depends on forest stand streamside riparian species and arrangement, POC pathogen spread of infection, and time since mortality.

**Comment:** *A suggestion is made in the DEIS that POC snags and logs can be replaced by other tree species, especially on high-risk sites, or with resistant POC. This is inaccurate, does not adequately disclose the functions of these species in riparian areas in comparison to POC, and shows a lack of understanding of the role of POC in the environment. Also, the SEIS presents conflicting information about the impacts of PL on non-ultramafic streams. For example, the fisheries section asserts that non-significant impacts will occur to coho salmon because PL killed trees will be replaced by other trees. However, information from stream modeling and the ecology section contradict this premise. [21-19, 32-24, 32-47]*

**Response:** The Ecology and Water and Fisheries sections were edited to reflect this comment.

Replacement of POC snags and logs by other species depends on the particular POC ecosystem. Some POC communities in the ultramafic riparian group do not feature other conifer species and may become dominated by shrubs if the POC canopy is lost. Most other POC communities include Douglas-fir, white fir, Jeffrey pine, or other overstory conifers. In the larger-size classes, these species could be expected to provide wood to streams, although their wood will not last as long as that of POC.

Because POC wood is exceptionally resistant to decay, POC logs could be expected to contribute to stream function for a considerable amount of time. Storm events in the high-gradient streams of this region, however, could result in the logs moving downstream

(Mellen, K., *personal communication*).

Based on research and monitoring data, dead POC trees cannot be expected to fall over quickly. Jules et al. (2002) documented uninfected POC snags still standing up to 200 years after their death. Monitoring data from the Agua-Stimpy project area (Medford BLM District, Grants Pass Resource Area) shows no infected POC falling over. This area has been infected since the mid-1970s (Betlejewski, F.B., *personal communication*).

On many POC riparian sites a lag time can be expected where alder, tanoak, or other pioneer hardwood species invade openings. Alder and other hardwoods will sometimes provide shade over streams within 3 to 5 years of colonization. Hardwoods, as they mature, are less desirable as downed material for stream function because they are often of smaller diameter than conifers and do not last as long. Whether conifers eventually become established in these streamside areas depends on site conditions and disturbance history.

**Comment:** *The draft SEIS should adequately disclose and analyze the effects of the alternatives, especially on anadromous fisheries (including in the Klamath/Siskiyou region, where it could be the essential ingredient for the survival of some native fishes and amphibians). Since POC supplies key habitat features for listed salmonids (shade to streams, streambank stability and large woody debris), the SEIS should discuss the consequences of the loss of POC to aquatic habitat. [21-18, 27-1, 27-7, 34-22, 32-27]*

**Response:** Text has been added to the document to clarify the ecological role of POC and the effects of PL as they pertain to stream and riparian functions.

The intent of the Water and Fisheries section is to describe the aquatic environment that would be affected by the proposed management strategies and to compare the impacts of the alternatives on physical and biological components of that affected landscape. The physical attributes of stream habitat are described, and the role of POC in stream channels and riparian areas is explained in the Water and Fisheries section and elsewhere (see Ecology section). The current status of salmonid stocks and the factors limiting them are presented because salmonids are recognized as good indicators of watershed health and the impacts of human activities. The attention to physical habitat is intentional because it is the infrastructure on which aquatic biota depend. The anticipated impacts to salmonids are described by region, with discussions of the physical habitat factors as they relate to fish and amphibians (see Wildlife section).

**Comment:** *Aquatic benefits may diminish from continued POC loss, and may trend towards ESA listings. The draft SEIS does not disclose whether loss of POC and salmonid habitat will cause jeopardy (under the Endangered Species Act), or reduce options for future recovery of coho. Choosing between Alternative 2 or Alternative 3, or another alternative that better protects POC in ultramafic salmonid areas has implications for ESA compliance. Cumulative effects must be considered in order to adequately assess the significance of the loss of POC and salmonid habitat values. Because the management actions involve coho salmon critical habitat, the USFS and BLM must formally consult with NOAA-Fisheries. [34-18, 34-20, 34-21, 32-45]*

**Response:** A biological assessment for impacts to coho has been included in Appendix 7 of the SEIS. The Water and Fisheries section of the SEIS contains a discussion of the cumulative effects of proposed POC management to salmonids, and these effects have been included in the biological assessment whenever they apply to coho. The impact assessment presented in the biological assessment will be evaluated by NOAA-Fisheries in regard to the effects on coho salmon. NOAA-Fisheries will determine if the management plan would be likely to jeopardize the recovery of coho. Consultation with NOAA-Fisheries for a management plan will be completed prior to signing of the record of decision. Subsequent Federal actions within the range of POC will tier to this record of decision and will consult with NOAA-Fisheries on an individual project basis. At that time, the impacts to coho of a given proposed action would be evaluated on the project scale.

**Comment:** *The draft SEIS fails to specify management that adequately protect streams providing habitat to coho salmon. [32-48]*

**Response:** Management measures included in the preferred alternative will be evaluated by NOAA-Fisheries when the plan-level consultation takes place. The adequacy of these management measures to protect coho and coho habitat will be determined during this process. Subsequent Federal actions will tier to this decision when consulting on individual projects. Text has been added to the document specifying how management of POC affects coho salmon.

**Comment:** *The SEIS understates the impacts to salmonids from the loss of POC on ultramafic soils. [32-54]*

**Response:** The impacts to salmonids (especially coho, steelhead, and resident trout) from the loss of POC on ultramafic soils are discussed by region and alternative in the Water and Fisheries section of the EIS. Further analysis has been done to refine the understanding of the magnitude of temperature increases, and text has been added to the SEIS to clarify the relationship between POC loss and stream temperatures in the ultramafic soils.

**Comment:** *The coho habitat miles of PL could be calculated, and the stream miles with increased stream temperatures could be estimated with GIS mapping. This information could be used in the draft SEIS fisheries section for a more precise discussion of the impacts to coho(e.g., in non-ultramafic soils). [32-56, 32-57]*

**Response:** GIS analysis has been completed to estimate miles of coho habitat affected by PL and a discussion of the impacts to coho based on the analysis has been added to the text. Table 3&4-18, Riparian and stream attributes in differing morphologies and relationship to PL, has been edited to clarify that much increased summer temperatures are not anticipated for streams in nonultramafic soils. Also see response to comment 32-51 on page A-154 for stream mile analysis discussion, and responses to comments 32-70 and 32-48 on page A-151 for further explanation of temperature modeling.

**Comment:** *The draft SEIS indicates that temperature impacts will occur primarily on ultramafic soils where coho salmon populations are low. Even if coho salmon densities are low on PL affected ultramafic streams, increased stream temperatures may limit production thus reducing distribution of coho salmon. If there are fewer viable populations this may adversely affect the Southern Oregon Northern California (SONC) coho salmon. [32-58]*

**Response:** GIS analysis has been done to estimate miles of coho habitat in ultramafic streams affected by PL, and a discussion of the impacts to coho based on the analysis has been added to the text. Also see response to comment 32-51 on page A-154. Further analysis has been done to refine the understanding of the magnitude of temperature increases, and text has been added to the SEIS to clarify the relationship between POC loss and stream temperatures in the ultramafic soils (also see responses to comments 32-70 and 32-48 on page A-151). Plan-level consultation with NOAA-Fisheries will be conducted to determine the adequacy of management measures to minimize adverse effects to coho and avoid jeopardizing the southern Oregon/northern California coho. Subsequent Federal actions will tier to this decision when consulting individually on a project, and effects to southern Oregon/northern California coho would then be considered by NOAA-Fisheries as the approved management measures are applied on a local watershed scale.

**Comment:** *Under the NWFP, it can be assumed that salvage logging will occur as in the past and large wood recruitment to streams will be decreased. The draft SEIS did not assess the impact of past and future salvage logging on PL killed POC, and so cannot conclude that "the streamside large woody debris recruitment rate would remain within the range of natural variability." As currently worded, the "Snag Retention" section of the SEIS would allow commercial logging of dead POC from Riparian Reserves by specifying an arbitrary number of snags along each 100 feet of stream. [32-60, 32-69]*

**Response:** Salvage is only permitted when wood levels for Aquatic Conservation Strategy objectives are met. The Standards and Guidelines do not specify a number of snags per segment of stream.

In addition, NEPA analysis of proposed actions would incorporate by reference watershed analysis and would be evaluated for consistency with the Aquatic Conservation Strategy. Consultation for individual projects involving logging within a Riparian Reserve would include an evaluation of the adequacy of instream large woody debris at the project scale. NOAA-Fisheries standards for the natural range of variability and the desired condition for large woody debris is not arbitrary, but has been established within ecological provinces based on best available science. See responses to comment 32-14 on page A-152, and comments 21-19, 32-24, and 32-47 on page A-155 for further analysis on the recruitment of large woody debris and snags following PL infestation, and responses to comment 34-16 on page 100, and comments 34-17 and 34-19 on page A-149 for a discussion of Aquatic Conservation Strategy consistency.

**Comment:** *The Agencies choice between Alternative 2 or 3 or another alternative that better protects POC in ultramafic/salmonid areas has implications for ESA compliance that are not disclosed in the draft SEIS. NEPA requires disclosure of information necessary to determine compliance with legal requirements such as the ESA, Clean Water Act, NFMA, and applicable Forest plan S&Gs. [34-21]*

**Response:** The Water and Fisheries section has been edited, and the biological evaluation for fish has been added to Appendix 7.

## Wildlife

**Comment:** *Information presented in the table entitled "Summary and comparison of the environmental consequences (effects) of the alternatives" and the table entitled "Numbers of* *wildlife species associated with the Southwest Oregon-Mixed conifer habitat type" is incomplete. [25-17, 44-34]*

**Response**: Corrections and additions were made to the two tables and associated text.

**Comment:** *The draft SEIS analysis failed to adequately address the role POC as a large diameter tree, snag, and down wood provider in mature and old-growth forests and what the loss of that component would mean to the forest ecosystem. [32-14, 32-28, 34-26, 44-32, 44-33]*

**Response**: The analysis was expanded to provide a more in-depth discussion on the effects of changes to the large-diameter tree, snag, and down wood dynamics predicted to result under each alternative.

**Comment:** *The Wildlife discussion is inadequate; it fails to list species except by category. The SEIS does not adequately address the effects of the alternatives on specific species, especially Special Status species. [34-49, 34-53]*

**Response**: A review of the available literature and query of field biologists working in southwestern Oregon failed to identify any wildlife species that are directly dependent upon POC. Just as with the overall suite of wildlife species, the special status species list did not contain any species specifically tied to POC. Given the absence of a direct tie between any particular species and POC, and the limited effects to the overall mixed conifer habitat generally, it is appropriate to consider effects to species that are associated with large-diameter trees, snags, and down wood as a group, by habitat component.

**Comment:** *The draft SEIS analysis did not adequately address the secondary effects of management actions; especially wildlife disturbance. [32-49, 43-79(S)]*

**Response:** The secondary effects of road closure/seasonal restriction and Clorox bleach use were discussed in the wildlife analysis. Additional analysis has been done and that information is now included.

## Pacific Yew

**Comment:** *The EIS should evaluate the economic and non-monetary values of Pacific yew trees, also susceptible to PL. [38-16(S)]*

**Response:** In September 1993, The FS, BLM, and the USDHH Food and Drug Administration released the final EIS for the management of Pacific yew. This document provided a comprehensive analysis of Pacific yew including inventories, autecology, occurrence, reproduction and growth forms, effects of management, genetics, ecosystem function, and response to damaging agents including PL. At that time, a total of 19 infected Pacific yew trees had been identified, all in areas with infected POC. While PL can infect Pacific yew, this continues to be rare.

**Comment:** *Since the Pacific Yew tree is also susceptible to P. lateralis, it should receive careful consideration in the prevention of the spread of P. lateralis. In recent months, there* *has been renewed collection of Yew bark and boughs for medical purposes. The collection of yew bark and boughs has the potential to spread P. lateralis during collection procedures. Yew harvest should be prohibited within the range of Port Orford-Cedar. [38-7, 34-23, 38-6, 43-81(S)]*

**Response:** Because Pacific yew is much less susceptible to PL infection than POC, the potential for infection is much less as well. Measures to reduce the spread of PL could include working in areas without POC. For example, Pacific yew is found in 40 plant associations on the Rogue and Umpqua NFs where POC does not grow. While Pacific yew and POC can occur together, Pacific yew also grows in areas within the range of POC that do not contain POC. Depending upon the alternative selected, mitigation measures prescribed by that alternative to reduce the spread of PL would be applied, similar to that implemented during the harvest of other special forest products in areas where POC is present.

## Genetics and Resistance

**Comment:** *The draft SEIS is overly optimistic regarding the development and success in breeding for disease resistance. The breeding program has yet to develop a line that is 100% resistant, and it is not known how successful resistance breeding will be in the long-term. [4-7, 11-9, 33-11, 38-1, 44-36]*

**Response:** There are reasons to be very optimistic about the durability of PL resistance in POC. As noted in the Genetics and Resistance section (Chapter 3&4), the genetic variation in PL is very low when compared with other forest pathogens; the PL spread mechanisms, although efficient, do not supply so much inoculum as to overwhelm resistance; and, rooted cuttings of parent trees (such as CF1) with the putative major gene resistance show virtually 100 percent survival in trials so far (up to 16 years). Mortality in trials was virtually all concentrated in the first 2 years, and the cause of early mortality is unknown. Seedling families also show moderate to very high survival levels contrasted with the 100 percent or near 100 percent mortality of the most susceptible seedling families.

**Comment:** *The draft SEIS says little or nothing about maintaining the ecological and genetic diversity of POC. [21-16, 32-74(S)]*

**Response:** The section on Conservation Genetic Considerations discusses genetic diversity issues. This section addresses some in situ and ex situ genetic conservation considerations in addition to deployment of resistant stock as a conservation measure. The section also includes a discussion of the general effects of the various alternatives on the genetic resource. The alternatives maintain the genetic diversity of POC to differing degrees. The SEIS further clarifies some ex situ conservation genetic considerations which relate to genetic diversity issues.

The Ecology and Plant Associations section of Chapter 3&4-3 has been rewritten to more accurately describe the relationship of the alternatives to their effects on the diversity of POC ecosystems. Numerical inconsistencies in the Ecology section have been corrected. The Ecology section addresses structure, function, and composition of POC ecosystems at the relevant scales for the Purpose and Need sections of the SEIS.

**Comment**: *Known resistance is sparse for much of the range and its effectiveness remains to* *be proven. There exist uncertainties about which geographic areas will produce resistance, whether there will be sufficient genotypes with resistance to support a wide program of planting, and whether that resistance will hold up over a rotation or is durable across the array of environments. [21-23, 25-3, 25-19, 25-22, 29-12, 31-20, 44-37]*

**Response**: Resistance is low in natural stands (perhaps 1 percent). The potential for selection of resistant trees is a function of the frequency of resistance, the number of selections made, and whether selections are made in stands with moderate to high mortality from PL or from stands with essentially no mortality. The highest number of resistant trees has been found in the breeding blocks (Breeding Blocks 1 and 4) from which the most field selections have been tested. Although the program to develop genetic resistance is relatively recent, under all alternatives (except Alternative 5) much more information should become available in the next 5 to 10 years. In addition, except Alternative 5, more field selections are planned (see Table 3&4-21 for timeline under the different alternatives). In breeding zones where there might still be too few resistant selections, use of traditional breeding to incorporate the resistance from neighboring breeding zones is possible. Monitoring of the current series of field plantings as discussed in Chapters 3&4 will continue to update the potential utility of resistant planting stock across a wide array of environments. Continued selection and breeding may provide additional natural resistance mechanisms.

**Comment:** *There exist uncertainties in how to assure success of planted resistant seedlings, how many resistant trees need to be planted to improve stand resistance sufficiently, and where POC genotypes can be successful if planted outside their native habitat. [21-23, 25-3, 25-19, 25-22, 29-12, 31-20, 44-37]*

**Response:** A discussion of the assumed planting policies and rates, along with discussion of likely growth rates, has been added to the assumptions section in Chapter 3&4 and to Appendix 6. For reasons discussed in the Genetics section, including the apparent strength of the resistance mechanism, the narrow genetic variation within PL (limiting its ability to adapt to resistant POC), the relatively slow rate of spread of PL, and the naturally wide genetic variability among POC trees even from the same stand, long-term durability of at least a portion of planted stock is considered likely. This would be adequate; planted seedlings routinely experience a certain level of mortality, and trees naturally thin as they grow older. Plantings of resistant POC will include many more trees per acre than would be needed in the mature stand to meet management objectives such as shading streams. Finally, breeding zones are designed to identify a general area in which local seed should be fully adapted. Movement of seed outside of these areas, if needed, reduces the percentage of trees likely adapted to the site, but does not automatically mean all trees will suffer. The results of moving seed to adjacent breeding zones is well studied with other species, and some data is available for POC, so likely effects can be considered in the context of need. However, only Alternative 5 is unlikely to have resistant seed from most zones.

Uncertainties in resistance durability do exist as described in the analysis. In any event, there is an acknowledged time lag between POC loss and potential replacement in kind and function. Those factors are recognized in the analysis of effects in the various alternatives. Negative ecological effects stemming from possible failure of long-term resistance and from the time lag to grow mature trees are clearly less in alternatives that also include measures to limit the spread of PL.

**Comment:** *Only one resistant gene has been identified, and that evidence has yet to be* *subjected to peer review. The current resistant gene is present in approximately 100 parents, but most reside in only one breeding zone. A mutation for virulence against this one gene will be unhindered by the genetic background. [21-23, 25-3, 25-19, 25-22, 29-12, 31-20, 44-37]*

**Response:** As indicated in Chapter 3&4, the resistance program is young and there are acknowledged unknowns, but evidence to date shows resistance holding up well, with all known visited resistant selected trees alive after 10 to 20 years in high-hazard areas infested with PL. Additional parents with strong resistance are expected to be found in the next 3 years as many more candidates undergo testing. At least one gene is responsible for the strong resistance in these approximately 100 parents confirmed so far. Studies to examine the nature and inheritance of resistance are underway. The survival shown by resistant families in young field trials as well as the continued survival of older resistant parent trees (after 10 to 20 years in high hazard areas infested with PL) indicates no breakdown of resistance. The resistant parents have survived 10 to 20 years, regardless of the how few resistant mechanisms (or the underlying inheritance of those mechanism) they might have. In the last 3 years, a series of field plantings have been established to confirm the short-term and long-term durability of genetic resistance across a range of sites, investigations of inheritance of resistance have begun, and a Ph.D. project to investigate mechanisms of resistance is underway. Finally, even if a mutation for virulence were to occur, there is no reason to believe it would spread rapidly across the landscape. The disease control mechanisms of Alternatives 1, 2, 3, and 6, plus an almost certain early recognition of the mutation, would subsequently limit its spread.

**Comment:** *Is it likely that rare alleles will be lost, and is not protection of rare alleles important? [25-18, 34-51]*

**Response:** While PL-caused mortality does not remove all trees over large areas, it is likely that some rare alleles will be lost as mortality spreads across the landscape. This also happens in nature where rare alleles are formed and lost over time. Loss of rare alleles was acknowledged in the section on Conservation Genetic Considerations. The exact extent of rare alleles is unknown due to the rarity of these alleles and having no known systematic way to survey or quantify across the species range. It is desirable to conserve alleles throughout a species genome. This is most often done via the natural populations in the natural environment, in addition to other in situ and ex situ conservation measures. These conservation measures help conserve both common and rare alleles.

**Comment:** *The putative natural resistance of POC to PL is touted throughout the draft SEIS. Hansen and Sniezko found that "The branch lesion test suggested that most of these trees were lucky 'escapes', and indeed many have subsequently died." [29-9]*

**Response:** Over 9,500 POC trees from natural stands or forests have been evaluated using the quick preliminary branch lesion test. Parents that exhibited small lesions were selected for a second more definitive root dip test. The parents surviving well in the root dip test have done as well (generally 100 percent survival as rooted cuttings) as the resistant control parent (CF1) that has been tested many times, and thus they would also be expected to do well in field plantings. Almost all the root dip testing of new resistant candidates has taken place since 2000, and there are still many parents to test. Resistance is rare in natural populations (less than 1 percent of trees), and the breeding zones with the most selections tend to have the most parents confirmed as resistant in the root dip test. There are about 100 confirmed resistant parents, but many breeding zones have less than 5 resistant parents and thus many more field selections are needed to meet the objectives of Alternatives 1, 2, 3, and 4, and Alternative 6 if resistance is a tool to be used. The timing to achieve this depends on the alternative selected, continuation of funding, and the geographic distribution and frequency of genetic resistance (see Table 3&4-21 for timeline under the different alternatives).

**Comment:** *What happens if the resistant breeding stock becomes more susceptible to other environmental stresses, such as drought, in the natural environment? More than resistant stock is needed to save POC as a viable component of various ecosystems. [44-17]*

**Response:** There is no evidence that resistant seedlings (or trees) will become more susceptible to other stresses. There is in fact evidence indicating that resistant trees survive many years in diverse environments. In addition, the parent trees confirmed as resistant come from a range of environments. If resistant stock is from parent trees representative of the geographic area of a particular breeding zone they would be expected to carry-forth the general adaptive traits necessary to survive and grow. The performance of resistant breeding stock will be monitored in the future over a range of conditions.

**Comment:** *How can it be said that "the genetic structure over the species' range would probably not be changed much" when the infested level is expected to be so great under Alternative 4, with infested areas to be replaced by resistant stock? Does this imply that that the structure is not changed much by the introduction of the resistant gene, or that the resistant POC will not be that widespread? If the percentage of trees with complete resistance is less than 1 %, how will re-introduction of resistant trees in large numbers not change the overall genetic structure of POC within its range? [44-35]*

**Response:** Generally, resistant POC will be planted on high-risk sites within each risk region. Using the acreage found in Table 3&4-4 for each risk region, however, only one-third of the range of POC is in high-risk sites. In the North Coast Risk Region this represents 20 percent, in the Siskiyou Risk Region, 40 percent, and in the Inland Siskiyou Risk Region, 60 percent of the range of POC. This will limit the introduction of large numbers of resistant trees across its range. If every high-risk acre were eventually planted with resistant POC, then there would still be a genetic reservoir of POC to draw upon in the future.

Additionally, there are genetic population dynamics at work. Populations of resistant stock will have an amount of genetic variation which can compliment and/or add to the diversity in the various locales where deployed. The exact degree to how much genetic diversity will be inherent in these populations cannot be answered in a simple statement. It depends on such factors as the underlying quantitative structure of the genome, how the "resistant genes" have coevolved with other genes, and the degree to which these genes are scattered across the species range and/or degree of localization of said genes. The planting of the stock represents the initial introduction of the genes into the local system. These genes will then become part of the gene pool (via pollen, seed formation at maturity) which becomes part of the genetic process that disperses, recombines, and creates genetic variation via the population genetic forces in nature. The cumulative change in genetic structure across the range depends on the pooled impacts that occur over thousands of populations/subpopulations. It takes many generations to change genetic structure to an appreciable degree over a large macrogeographic range, due primarily to the evolutionary forces at work (such as migration, selection, mutation, and drift) in combination with the complex environmental heterogeneity that exists.

## Fire and Fuels

**Comment:** *The draft SEIS states that Alternative 3 could have the greatest potential effect on fire suppression and fuels management due to road closures or seasonal road restrictions in POC buffers and cores. Alternative 3 relies on existing reserves, and it "may" or "could" result in decommissioning parts of the road system. Whether access would be reduced is speculative. [32-30]*

**Response:** The SEIS describes Alternative 3 in Chapter 2 and the measures that apply to the POC cores and buffer areas in uninfested 6th field watersheds. A key measure is conducting a transportation analysis to determine road needs. A majority of these watersheds outside of wilderness contain roads. Management objectives are to minimize the road system within the POC cores and minimize the road system available for public use within and entering these 6th field watersheds (buffers). The analysis "could" result in decommissioning roads and reducing the total number of road miles. There are many roads within these watersheds, and it is reasonable to foresee that some would be decommissioned or closed with barricades to meet POC management objectives.

**Comment:** *The SEIS states that Alternative 3 (the most protective alternative) would have the most adverse effects on fire suppression due to reduced access. The draft SEIS should have disclosed that reduced road access would result in fewer fires since human caused fires occur most often along roads. [32-30, 32-32]*

**Response:** The SEIS describes in Chapter 3&4 the fire occurrence within the range of POC. A majority of the fires are lightning caused (52 percent), as are most fires larger than 1,000 acres (79 percent). Most human-caused wildland fires occur near residences, major roads and highways (debris burning, children, equipment, miscellaneous), and dispersed recreation sites. Fires caused by recreational users (such as campfires and smoking) were only 22 percent of all fires, and only a small percentage of these would be in the POC core and buffer areas. Roads do increase public use of wildlands, and there could be an increased risk of human-caused wildland fires from such use. However, when fires occur near the roads, initial attack resources also have good access to suppress fires. Roads also provide access, fire control lines, and escape routes for fires that escape initial attack and/or become large fires. Acreage is often given up on wildland fires to use roads as the primary firelines. In general, well-roaded areas may have more human-caused wildland fires, but they are more often kept small. The total number of acres burned from all wildfire causes is probably less in roaded areas than in those with poor access. In any event, the most acreage burned in wildfires occurs from nonhuman causes (lightning).

**Comment:** *The conclusion that Alternatives 1 and 3 would result in increased costs and reduced effectiveness for fire suppression resources is speculative. In the Biscuit Fire, for example, adding bleach to a tanker of water took approximately seven seconds, not enough time to noticeably affect fire suppression efforts. [32-32]*

**Response:** The Fire and Fuels section in Chapter 3&4 provides a detailed discussion of the potential for increased costs and reduced wildland fire operations effectiveness due to POC management practices. Those effects are greatest with helicopter use, during extended attack or large fire operations. The SEIS used the Biscuit Fire as an example of a large fire where current POC management practices added 1 to 2 percent to the total cost of a very large and expensive wildland fire.

**Comment:** *The draft SEIS states that Alternative 3 would affect the ability of the Agencies to meet hazardous fuels treatment objectives in the wildland-urban interface areas (WUI). The EIS should disclose the location of the affected WUI's and explain how Alternative 3 would hinder the ability to treat hazardous fuels. Reducing road density or increasing seasonal road closures in POC buffers and cores would not necessarily limit access for fuel treatment projects and prescribed burning crews and resources. Seasonally closed roads could be used for "administrative use", provided that equipment was washed and personnel were free of mud and debris that might contain PL. [32-32]*

**Response:** The SEIS discloses the number of acres of both POC cores and buffers by alternative that could be affected within the wildland-urban interface. The SEIS also discusses in detail the reasons why POC management practices would increase the cost of fuels treatment operations. There is a cost associated with gate installation, inspection and maintenance; washing vehicles and equipment; cleaning personnel; inspection of personnel, vehicles, and equipment; project specific risk analysis; documentation; and monitoring. These costs translate into higher unit costs per acre treated, and into fewer acres treated when there is a finite amount of fuels treatment dollars. Administrative use, particularly on a daily basis during the wet season, could be a high-risk activity for POC. Mitigation measures may not be adequate to allow the project or reduce the risk without again incurring higher costs. Most of the acres are along the western edge of the Grants Pass-Caves Junction corridor.

**Comment:** *The SEIS failed to consider that protection of POC may help prevent unnaturally intense fires. Loss of POC from ultramafic areas may increase hazardous fuels due to replacement by more ladder fuels and brush. [34-46]*

**Response:** The Fire and Fuels section in Chapter 3 & 4 discusses the need for integrated vegetation management and hazardous fuels reduction within the range of POC (potentially tens of thousands of acres per year). Treatment objectives are to change fire behavior by reducing its rate of spread or intensity, and reduce unwanted fire effects. Although protecting large POC could prevent more understory ladder fuels and brush, at the landscape scale, there is already an excessive amount of downed woody fuels, ladder fuels, and brush compared to historic conditions. Outside of the recent Biscuit Fire area, wildland fires would continue to be unnaturally severe until existing hazardous fuels are reduced.

**Comment:** *I do not understand the statement in the Fire and Fuels section that "many of these (fuel) treatments are accomplished on the same acre." [44-38]*

**Response:** Fuel treatments are often a sequence of specific treatments that can occur at different times of the year or over several years. For example, understory vegetation maybe cut (in a 100-acre stand), handpiled (100 acres), the hand piles burned (100 acres), and the entire area understory burned (100 acres) in separate treatments at different times. Depending on the funding and timing, these may all be claimed as separate accomplishment acres (400 acres of accomplishment), but done on the same acres (same 100 acre stand treated).

## Air Quality

No substantive comments were received.

## Recreation, Visual, Wilderness, and Wild and Scenic Rivers

**Comment:** *The Recreation, Visual, Wilderness, and Wild and Scenic Rivers section of the draft SEIS did not adequately analyze the effects to non-motorized recreation activities and was biased toward effects to motorized access. [32-31]*

**Response:** Access to the public lands is most commonly achieved by motorized means. Mitigation activities included in the Standards and Guidelines of the various alternatives that affect levels of public access are key to evaluating impacts. The effects to nonmotorized activities are directly related to levels of public access. One activity (achieving access) must occur before the other (recreation activities).

**Comment:** *The effects to Wilderness and Wild and Scenic River values were not discussed adequately. [32-31]*

**Response:** The text has been modified to reflect wild and scenic river values as being similar to wilderness values. Both areas are managed in a way that allows natural processes to occur and dominate, with the quality of visual and aesthetic values being both the primary resource and the elements at risk from PL.

**Comment:** *The draft SEIS is biased toward allowing motorized access in POC areas. [32-43]*

**Response:** Levels of access for recreation opportunities, commercial activities, or silvicultural management functions are all affected by the varying degrees of mitigation (road closures/decommissioning). No one user group is singled out for exceptions to access limitations. Activities would be subject to the risk key (Alternatives 2, 3, and 6) depending upon the level of risk they posed, with motorized access more likely to be restricted than other travel. Similarly, the POC core and buffer areas in Alternatives 3 and 6 have additional vehicle restrictions.

**Comment:** *Public education efforts should be employed to inform/instruct off-highway vehicle users regarding the need for closures that affect their use. [44-9]*

**Response:** The Community Outreach provision in Alternative 2 (also applicable to Alternatives 3 and 6) has been changed to include ". . . consider focusing theses efforts on user groups most likely to engage in activities at more risk for spreading PL . . . " precisely to focus education efforts where they are most needed. The land management Agencies all share the tool of public education as an effective measure to reduce user impacts to the land. As off-highway vehicle enthusiasts (if unrestricted) are the most likely recreation group to contribute to PL infestation due to the nature of the activity, positive education and management efforts would be employed with this user group to reduce their impacts to the land.

**Comment:** *For all alternatives, the author states that "the visual quality of the characteristic landscape could suffer degradation until stands recover with replacement conifer spe-*

*cies." This is not an accurate statement for ultramafic areas. [44-39]*

**Response:** The text has been changed to reflect that ultramafic soils will be slower to recover.

## Areas of Critical Environmental Concern and Research Natural Areas

**Comment:** *Appendix 8 should include only those areas that support POC. Please clarify the meaning of the POC/PL column and indicate the proportion of PL infestation of the protected POC stands. [25-31]*

**Response:** Table A8-1 has been modified to show only those areas of critical environmental concern and research natural areas that contain POC.

The POC/PL column is meant to show whether or not the ACEC or RNA is infested or uninfested with PL. The letters "POC" indicate uninfested ACECs or RNAs and the letters "PL" indicate the ACECs or RNAs are infested. The table has been modified to reflect this comment.

The number of acres with healthy POC or the number of acres infested with PL for each ACECs or RNA has not been determined for this analysis. This detail is not needed for the programmatic nature of the alternatives.

**Comment:** *Appendix 8 shows five ACECs or RNAs currently have root disease, and four of these special status areas were selected at least partially for the presence of POC associated plant communities. The ACEC designation is restricted to "areas containing truly unique and significant resource values" (Appendix 8). Management plans should be developed to reduce the spread of PL in these areas, primarily be eliminating those activities which foster its spread. They should be closed to ORV use, mineral entry, and timber harvest, even those areas not currently infested. Foot traffic should be subject to regulations which are designed to keep PL out of these areas. [44-40]*

**Response:** Each ACEC and RNA retains its designation regardless of which alternative is selected under the POC SEIS. Each ACEC and RNA will continue to have a management plan that has specific direction for activities permitted within the ACEC or RNA. These management plans already provide some restrictions, and they could be revised to provide the protections suggested in this comment if the individual situation warrants such restrictions. Details for the individual ACEC or RNA management plans are outside the scope of the programmatic alternatives in this SEIS.

**Comment:** *The Research Natural Area mentioned for the Powers Ranger District is substantially infested with PL. This needs to be clarified in the SEIS. [25-28]*

**Response:** The Distribution Across the Range section was not intended to describe specific locations of PL, but rather broadly depict POC in large geographic regions. Appendix 8, however, does acknowledge the presence of PL in the Coquille River Falls RNA.

## Culturally Significant Products for American Indian Tribes

No substantive comments were received.

## Special Forest Products

**Comment:** *POC on Federal forest lands is not a major source of special forest products. Commercial bough cutting from these lands composed only 4 percent of the total commercial activity. Since this is a higher risk activity for PL spread, it should be eliminated on Federal forest lands as the economic consequences would be slight. [44-41]*

**Response:** The resource management plans of the land management Agencies within the range of POC direct these Agencies to manage their respective lands for multiple uses while maintaining the health of ecosystems within those lands. This approach provides for the preservation and restoration of the biological elements within ecosystems while also recognizing and providing important food, fiber, recreation, and jobs. Commercial, Tribal, and personal use cutting of POC boughs are valid activities consistent with ecosystem management goals. Additionally, the NWFP directs the development of special forest product programs to support the economic diversity of local resource dependent communities. Therefore, an effort was made not to eliminate all Federal commercial bough harvest. However, bough harvest is permitted in Alternatives 2, 3, and 6 only under very specific and controlled circumstances. In Alternatives 3 and 6, it is not permitted in core areas at all.

**Comment:** *Special forest product activities should be permitted in low-risk areas only, preferably areas without POC and/or during dry seasons, and permit conditions strictly enforced. Gatherers should not be allowed to travel between infested and uninfected areas, either by car or on foot. [44-41]*

**Response:** Currently, permits for special forest products are only issued if, after an evaluation of the activity, it is consistent with the land use objectives, it will not affect the sustainability of the product, and potential adverse effects on other resource values have been considered. Stipulations or conditions are made a part of these permits and enforced to ensure these goals are achieved. Alternative 2, 3, and 6 include a Management Practice that, when a need is indicated by the risk key, restricts operations to the dry season or requires strict administrative measures. Under Alternatives 3 and 6, no permits will be issued in the POC core areas. Mushroom gathering, firewood cutting, and Christmas tree cutting, in addition to hunting or hiking by adjacent property owners, are considered lower risk activities for the spread of PL. Restricting the travel of gatherers between infested and uninfected areas may not be logistically possible depending on road systems, checkerboard ownership, and where people live in relation to the area. Permitted gatherers may be required to wash boots and vehicles to mitigate the risk of spread.

**Comment:** *If bough gatherers are allowed to use the boughs from roadside sanitation products in the core buffer areas, the boughs should be brought to outside the buffer areas by Federal Agency workers, rather than allowing contracted workers to come in and thereby risk the increase of PL infestation. The by products of roadside sanitation should be dealt with in a manner that reduces their impact on uninfected areas including no commercial use. [44-42]*

**Response:** Roadside POC sanitation projects will likely be conducted by contracted workers, therefore a distinction between contracted workers cutting and piling trees for burning, contract workers delimbing trees and gathering boughs, or Agency workers gathering and transporting boughs may not be practical or logical with regard to risk of spread. With the restrictions imposed by the Standards and Guidelines for Alternatives 2, 3, and 6, roadside sanitation is regarded as a measure with benefits outweighing drawbacks with respect to PL spread. Secondly, it produces post, wood, and bough commodities that are valued by the public and defray the cost of the sanitation.

## Timber Harvest

**Comment**: *The impact of partial suspension yarding is much different than that of tractor logging and the impacts should be analyzed either separately or in conjunction with full suspension. [2-24]*

**Response**: These statistics have been broken out into three categories in the Timber Harvest effects section for clarification. The Management Practice in Alternatives 2, 3, and 6 has been changed to lump partial-suspension with other aerial or cable systems.

## Costs

**Comment**: *Economic mechanisms of the timber industry, the changing economic base and role of Federal lands, or opportunities to create jobs were not considered. [29-4]*

**Response**: These topics have already been discussed in the associated land and resource management EIS for each respective administrative unit.

**Comment:** *Cost considerations when using the Risk Key described in Alternative 2 are needed. [45-5]*

**Response**: As stated in the Purpose section, management strategies are considered if, among other criteria, they are cost effective. While not a specific risk key element, cost can be a factor in the selection of one or Management Practices to mitigate that risk. Selection of specific Management Practices stemming from use of the risk key is determined based on site-specific conditions. The cost-effectiveness of various Management Practice options or combinations can also be considered outside the key in the site-specific analysis.

**Comment**: *Historical expenditures of implementing Alternatives 2 and 3, and their relative effectiveness of limiting the rate of spread of the disease, are not disclosed. [45-6]*

**Response**: Because Alternatives 2 or 3 will take place in the future if selected, direct future costs of these alternatives are estimates. These estimates are based upon actual historical expenditures of past individual actions and associated unit costs (for example, sanitation treatment on a per mile basis). Effectiveness of various management techniques on minimizing the spread of PL is currently being evaluated.

## Environmental Justice

No substantive comments received.

### Civil Rights Impact Assessment

No substantive comments received.

### Critical Elements of the Human Environment

No substantive comments received.

### Other Environmental Consequences or None

**Comment:** *The draft SEIS does not consider that climate change may alter PL infection mechanisms by altering temperature and precipitation patterns. [34-36]*

**Response:** While not discussing climate change or global warming per se, the Pathology section does describe the conditions favoring the spread of PL. With this information, managers can respond to any changes in climate, like shorter dry seasons for example, during project planning and site-specific application of mitigating Management Practices. Monitoring of PL spread rates, however, will likely be a more important way of dealing with climate changes. If spread rates increase, monitoring will reveal a need to modify the strategy.

**Comment:** *The way in which the draft SEIS is organized makes it exceedingly difficult to follow. In particular, the combining of the Affected Environment and Environmental Consequences sections is confusing. [32-9]*

**Response:** Other readers, and authors in particular, find benefit to having the affected environment described along with the effects for the same resource. The combination was done to ". . . more clearly present information to readers . . . " (Chapter 3&4, page 1), and copies the format used in the 1994 NWFP SEIS, the 2000 Survey and Manage SEIS, the 2003 Survey and Manage Draft SEIS, the 2003 Aquatic Conservation Strategy SEIS, and others.

**Comment:** *The SEIS is missing the required distribution list. [44-48]*

**Response:** The distribution list for the final SEIS has been added to Chapter 5.

## Chapter 5

### Preparers

No substantive comments received.

### References

**Comment:** *Some of the references should be checked for correctness and relativity to the subject. [21-22]*

**Response:** References have been checked and corrected as necessary.

### Glossary

No substantive comments were received, except those answered as part of another comment.

### Index

No substantive comments received.

## Appendices

### Port-Orford-Cedar Management Guidelines

**Comment:** *Appendices 1 and 3 contain POC management direction for all administrative units except the Siskiyou National Forest, but it is not apparent from reading that language how any of it can be applied with any consistency in using the risk key. [45-4]*

**Response:** The management direction for the Siskiyou NF is in Chapter 2 under Alternative 1. Appendix 3 just includes the current management direction for cooperating units and the Suislaw NF, which are not among the action Agencies. The risk key is a feature of Alternative 2 and would only apply to the action Agencies. An explanation of the relationship of Appendix 3 to the alternatives has been added to the beginning of Appendix 3.

### Summary of Agency Actions for Fiscal Year 2001–2002 Under the Existing Direction for Port-Orford-Cedar

**Comment**: *The average size of POC that have been removed as a result of roadside sanitation treatments has not been described. [44-7, 44-11]*

**Response**: The average size of POC removed from sanitation project areas has not been documented and therefore unknown. However, few POC logs are removed unless they are of merchantable size (equal to or larger than 8 inches diameter at breast height), and in the past, most sanitation treatments have excluded merchantable volume.

**Comment**: *The SEIS does not disclose whether mining operators are required to follow the same mitigation techniques as the Agencies. [44-8]*

**Response**: A mining section has been added to Chapter 3&4.

**Comment**: *Field selection (i.e. removal) of resistant trees is not described. [44-10]*

**Response**: The discussion of the Interagency Port-Orford-cedar Breeding Program in Appendix 2 says that vegetative material is collected, but does not fully describe what vegetative material is being collected. Approximately 10 to 15 limbs about 12 inches in length are collected from each candidate tree and, when available, 50 to 100 mature cones are also collected.

**Comment**: *If heat kills the pathogen, why is Clorox-treated water necessary for wildfire management? [44-10]*

**Response:** Clorox bleach-treated water is used for wildland fire operations, including water used to wash equipment, water roads for dust abatement, and for helicopter drops on the fire itself. Although some research indicates heat kills PL in certain conditions, it has not been demonstrated whether this happens in waters dropped on fires. Also, since water is often dropped on hot spots along the fire perimeter, some of that water may land on areas that have healthy POC outside the fireline where the water delivery itself could serve as a spread mechanism for PL. Other areas where infested water may be dropped may be inside the fireline, but go unburned, get only lightly burned, or the water may even run off into ditchlines and watercourses where it could infest roadside POC or be channeled through culverts and threaten healthy POC downstream.

**Comment:** *The eradication treatments being planned for the Shasta-Trinity National Forest in 2003 are not explained. [44-12]*

**Response:** Appendix 2, Summary of Agency Actions, is not meant to explain specific actions in detail and all reasons for possibly using them, but is intended to serve as a brief encapsulation of Federal Agency POC actions. A general description of eradication treatments can be found on in the Standards and Guidelines for Alternative 2.

## POC Standards and Guidelines in the Land and Resource Management Plans in Region 5, SEIS Cooperating Agencies, and the Siuslaw National Forest

**Comment:** *Monitoring results should be provided and clearly summarized to date in the SEIS regarding how effective current management practices may be and how to improve their effectiveness for future management of Port-Orford-cedar. [45-2]*

**Response:** Agency knowledge about the effectiveness of the various root disease mitigation measures is described in the Pathology section of Chapter 3&4. Potential limitations on this knowledge are described in the Incomplete and Unavailable Information section early in Chapter 3&4. Many of the practices are well founded in science and other root disease control experience and are therefore reasonably expected to work as prescribed. Implementation monitoring assures that required actions are actually done at the project scale. This is reviewed annually and indicates a very high degree of compliance. Specific results of various trials are not directly part of this SEIS, as they have been developed over several years as POC root disease management has evolved.

**Comment:** *We have heard that vehicle washing doesn't really happen, even if required. We have often asked Roseburg BLM for washing monitoring or inspection reports, but there are none. We have personally witnessed logging equipment moving in and out of areas with no washing being done, even though the EA had promised it would be required. [38-13(S), 4-3, 37-3]*

**Response:** The pathology and other effects described in the SEIS are based in part on Agency experience with the current direction, and in part on an expectation that direction will be followed as written. Annual implementation monitoring indicates a high degree of consistency with EA requirements. The Agencies would appreciate questions about apparent departures from EA-agreed direction being directed to local managers.

## Existing Direction — Six Rivers National Forest

No substantive comments received.

## Existing Direction — Klamath National Forest

No substantive comments received.

## Existing Direction — Shasta-Trinity National Forest

No substantive comments received.

## Existing Direction — Siuslaw National Forest

**Comment:** *All areas of the Oregon Dunes National Recreation Area that have POC need to be closed to off-highway vehicles to reduce the risk to unique POC "island" communities in the dunes. [34-38]*

**Response:** Management direction in the Oregon Dunes is outside the scope of the SEIS. The Oregon Dunes were not included as an action Agency or cooperator in part because their POC was so limited, and because it is covered by the relatively recent management plan for the Oregon Dunes. Under that plan however, as explained in the Distribution Across the Range section of Chapter 3&4, the older POC in island communities in the dunes are in a management category designed to maintain, restore, or enhance its condition. Off-highway vehicle use is prohibited near these communities.

## Clorox Use, Toxicity, Potential Environmental Effects, and Label Information

**Comment:** *The application of water treated with Clorox (sodium hypochlorite) to fires in the presence of organic aromatic compounds, and the heat of combustion, is likely to lead to the production of dioxin. [36-5]*

**Response:** There is considerable debate as to how much of the dioxin occurring in the environment can be attributed to natural sources such as wildland fire versus that generated by humans (Gordon 1994). Dioxin is a product of the incomplete combustion of biomass due to the natural occurrence of chlorine in plant tissue, and can be produced through the combustion of waste, fuel wood, and in this case wildland fire (EPA 2001). Expressed as a portion of dry weight, there is approximately 100 parts per million chlorine in plant tissue (Epstein 1972). It is therefore unlikely that the application of a 50 parts per million water solution of chlorine to portions of a fire would result in a significant increase in dioxin production above that already being produced by the fire.

**Comment:** *How much Clorox would be used during the life of the EIS, what is the fate of the Clorox treated water, and would there be a negative environmental effect? [38-14(S)]*

**Response:** The use of Clorox bleach is described in the Standards and Guidelines section of Chapter 2. The Standards and Guidelines call for water to be treated with Clorox bleach where PL-free water is not available for wildland fire operations, equipment and tool washing, and road watering, to limit the spread of PL. Appendix 4 describes the past and anticipated future use rates of Clorox bleach, and provides environmental hazard information. Appendix 4 states that during the Biscuit Fire on the Siskiyou NF in 2002 approximately 26,700 gallons of Clorox bleach were used in accordance with the label during fire suppression and restoration activities. The Biscuit Fire, however, was a fire of unprecedented scale in recent Oregon history. The average annual use rate for fire use is projected to be 1,000 to 5,000 gallons with other uses less than that. This is consistent with future wildland fire predictions included in the Fire and Fuels section of Chapter 3&4.

Sodium hypochlorite, the active ingredient in Clorox, is a strong oxidant and 97 to 99 percent of the material will quickly break down to produce water, chloride ions, and disinfection byproducts such as chloramines. Chloramines may persist in an upland setting for a few days and in an aquatic setting for up to a week.

Sodium hypochlorite is a well known and widely used compound and has been extensively studied. Clorox bleach is of relatively low toxicity to nonhuman mammals and birds. In 1991, the EPA determined that human risks from chronic and subchronic exposure to low levels of Clorox bleach were minimal and without consequence to human health (EPA 1991).

Clorox, however, is highly toxic to aquatic organisms. The freshwater criteria for the protection of most aquatic species and their uses are 11 micrograms per liter total residual chlorine as a 4-day average (0.011 parts per million) and 19 micrograms per liter as a 1-hour average (EPA 1984). Toxicity levels for several relevant fish species were added to Appendix 4. In addition, following the EIS going to press, it came to the attention of the authors that there had been three fish kills during the Biscuit Fire. These were all due to the release of freshly chlorinated water at fill sites and are now described in Appendix 4. If Clorox bleach is added after tanks have been filled and away from the fill site, future events such as these would likely be avoided.

## Monitoring Plans for Each Alternative

**Comment**: *Current POC management direction is either not implemented or, when it is, does not work. [21-7]*

**Response**: Monitoring of compliance with Standards and Guidelines is conducted by both Agencies annually, and this monitoring continues to find a very high level of compliance with land and resource management plan Standards and Guidelines. Additionally, as alluded to in both the Pathology section and the Monitoring section (Appendix 5), various root disease control practices are systematically investigated for their effectiveness. Evaluation of specific Management Practices is ongoing. Relative effectiveness of various Management Practices is shown in the Pathology section.

**Comment**: *The effectiveness of gates as a mitigation measure is suspect. [32-19]*

**Response**: Jules et al. (2002) have shown that 72 percent of the infection events they studied were the result of vehicle traffic. Reducing vehicle access by gates or other means reduces the potential to spread PL. The monitoring plans for the Action Alternatives require Agencies to ". . . continue to evaluate and coordinate existing management techniques to reduce the occurrence of PL and retain healthy POC." Recent evaluations specifically for gate closures are described in the Pathology section.

**Comment**: *In the Monitoring Plan, the Effectiveness and Validation question says "has the spread or non-spread of the disease significantly departed from the predictions made in this SEIS that were used to select a management strategy?" Since the SEIS elsewhere explains there is an "S" curve that describes a variable rate of infestation over time in infested watersheds, what numbers will be used to identify departures? [34-33]*

**Response**: While the infestation in any given area or watershed follows an "S" curve, the overall spread across the range or entering into uninfested watersheds, and thus the acres of PL infestations for large areas such as the entire range in Oregon, should be relatively lineal. Nevertheless, it may take several years to detect a departure or even decades to detect a small departure. An important criterion for spread rates is not only where individual sites of infestation are on the "S" curve, but how many new sites occur during a given period of time. Continuation of current mapping, and mitigation practice effectiveness monitoring, will help reveal if there are significant departures in the short term.

**Comment:** *We are concerned about monitoring requirements. While forest will be required to report on their efforts, how often will the overall strategy for management of POC be reviewed? Will sufficient data be gathered about the efficacy of approaches so that we can be sure that managers are taking the best approaches and conditions are not changing in ways that are difficult to detect. The fundamental idea behind adaptive management is to be able to shift gears if new evidence appears; this approach depends on good monitoring. [39-4]*

**Response:** To answer the question of whether the spread or non-spread of the disease has significantly departed from the predictions made in this SEIS (that were used to select a management strategy), the monitoring plan says that as new inventory data (CVS and FIA) and local mapping become available, it will be evaluated for current levels (acres and/or number of trees) of infected and uninfected POC and corresponding trends. Inventory plots are typically reinventoried on a 3- to 10-year cycle, depending upon location.

## Port-Orford-Cedar Seed and Seedling Deployment Strategy

The Port-Orford-Cedar and Seedling Deployment Strategy has been replaced by the Resistant Port-Orford-Cedar and Growth Assumptions.

## Biological Evaluations

**Comment:** *An analysis of the effects to fisheries was lacking in the biological evaluation. [21-20, 34-52, 45-7]*

**Response:** A fisheries section has been added to the biological evaluation.

**Comment:** *Consultation for effects to threatened and endangered species will be needed. [21-20, 32-45, 45-8]*

**Response:** Consultation with the USFWS and NOAA-Fisheries will be completed prior to the release of the record of decision.

**Comment:** *The EIS does not disclose the degree of ESA "take" or whether the loss of salmonid habitat values will cause jeopardy or reduce options for future recovery of listed coho. [34-20]*

**Response:** *Take* and *jeopardy* are components of the processes dealing with consultation upon the effects of a proposed action to threatened and endangered species. The determinations are made in conjunction with, or by, the regulatory Agencies (USFWS, NOAA-Fisheries) during the consultation process, as prescribed, for compliance with the "Endangered Species Act."

**Comment:** *The table entitled "Summary and comparison of the environmental consequences (effects) of the alternatives" in the Summary section of the SEIS presents information that does not agree with that presented in the Biological Evaluation. [44-2]*

**Response:** The table and associated text have been corrected to match the information in the biological evaluation.

**Comment:** *Information presented in the Biological Evaluation regarding the effects of the alternatives to the northern spotted owl, marbled murrelet, and bald eagle were incomplete or unclear. [44-45, 44-46, 44-47]*

**Response:** The biological evaluation was rewritten to more clearly identify the effects of the preferred alternative to threatened and endangered species.

## Areas of Critical Environmental Concern and Research Natural Areas and Requirements for Designation

No substantive comments were received.

## Summary of Modeled Stream Temperature Increases Resulting from Port-Orford-Cedar Mortality

No substantive comments were received.

## Maps

No substantive comments were received.

# Appendix 11:  Reprinted Comment Letters from Governmental Entities

This appendix contains comment letters received on the Draft SEIS from Federal, state, and local government agencies; American Indian Tribal organizations; and elected officials.

The Environmental Protection Agency has a legal obligation under Section 309 of the "Clean Air Act" to review and comment on environmental impact statements.  Their letter reviewing the Draft SEIS appears at the beginning of this appendix.  An explanation of the EPA rating criteria is also included.

*These are the letters that follow:*

1)  U.S. Environmental Protection Agency, Region 10 (#48)
2)  U.S. Department of the Interior, Fish and Wildlife Service, Roseburg Field Office (#45)
3)  Douglas County (Oregon) Board of Commissioners (#47)
4)  Oregon State Department of Forestry (#49)

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 Sixth Avenue
Seattle, Washington 98101

SEP 23 2003

Reply To
Attn Of: ECO-088

Ref: 03-011-BLM

Ken Denton, SEIS Team Leader
Port-Orford-Cedar SEIS Team
P.O. Box 2965
Portland, OR 97208

Dear Mr. Denton:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the proposed **Management of Port-Orford-Cedar in Southwest Oregon** pursuant to our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA) as amended. Section 309, independent of NEPA, directs U.S. EPA to review and comment in writing on the environmental impacts associated with all major federal actions.

Stands of Port-Orford-Cedar, an economically and ecologically important forest species, have become affected by the exotic root pathogen, *Phytophthora lateralis* (PL). PL is nearly always fatal to the cedars it infests. PL is spread by the transport of spore-infested soil by humans and other vectors. Currently, PL has infested 9-15% of the federally administered land within the project area. This DSEIS was prepared as a response to a decision by the U.S. Court of the District of Oregon. The Court found that BLM's previous environmental analysis had not adequately considered the "direct, indirect, and cumulative impacts on PL and Port-Orford-Cedar" over the entire range where it naturally occurs.

The DSEIS evaluates five different strategies to manage Port-Orford-Cedar within southwest Oregon on Bureau of Land Management (BLM) and National Forest lands. For baseline purposes, the DSEIS has proposed the No Action Alternative (Alternative 1) which is the current management approach. The four Action Alternatives are Alternative 2, 3, 4 and 5. The DSEIS identifies Alternative 2 as BLM's Preferred Action Alternative.

Based upon our review of the preferred alternative, EPA has rated the EIS EC-2 (Environmental Concerns - Insufficient Information). The rating and a summary of our comments will be published in the *Federal Register*.

1

Our main concern is that Alternative 2:

(1) Will provide nominal prevention from infestation compared to the current management direction (Alternative 1). Under Alternative 1 projections, the estimated area of infestation in 100 years will be 35% of the acres where Port-Orford-Cedar is prominent. Under the Preferred Alternative (Alternative 2) projections, the estimated area of infestation in 100 years will be 33% of the acres where Port-Orford-Cedar is prominent. The difference between the two Alternatives is nominal, only 2%. In comparison, Alternative 3 projects that infestation levels will cover 28% of the areas where Port-Orford-Cedar is a prominent element of the forest composition, a more substantive 7% difference.

(2) Does not provide additional protection of uninfested areas from PL. These areas can act as a refugia of diversity and abundance of an unimpaired Port-Orford-Cedar ecosystem. Since PL is nearly always fatal and since the resiliency and robustness of Port-Orford-Cedar resistance stock has not been adequately proven at the landscape level, we strongly recommend that the preventive elements of Alternative 3 (providing access limitations and restricting timber harvesting in Port-Orford-Cedar stands to 32 currently uninfested watersheds) be incorporated into the finalized Preferred Alternative developed for the FSEIS.

I encourage you to contact Tom Connor at (206) 553-4423 if you would like to discuss our comments and how they might best be addressed. Thank you for the opportunity to review this Draft SEIS on the Management of Port-Orford-Cedar in Southwest Oregon.

Sincerely,

Judith Leckrone Lee

Judith Leckrone Lee, Manager
Geographic Unit

Enclosure

2

**United States Department of the Interior**

TAKE PRIDE IN AMERICA

**FISH AND WILDLIFE SERVICE**
**Roseburg Field Office**
**2900 NW Stewart Parkway**
**Roseburg, Oregon 97470**
**(541) 957-3474 FAX: (541) 957-3475**

File Name: POC_DSEIS_Comments.doc
TS Number: 03-5397

September 16, 2003

Ken Denton
Port-Orford-cedar SEIS Team Lead
Bureau of Land Management
P.O. Box 2965
Portland, OR 97218

Subject: Comments on the Port-Orford-cedar Draft Supplemental Environmental Impact Statement

Dear Mr. Denton:

Staff in the Fish and Wildlife Service's (Service) Roseburg Field Office and Arcata Field Office, have reviewed the Port-Orford-cedar Draft Supplemental Environmental Impact Statement (DSEIS). This letter has been prepared under the authority of, and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat.884], as amended, the Migratory Bird Treaty Act (16 U.S.C. 7003-711), as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

**General Comments**

- The DSEIS indicates that restricting entry in the uninfected core and buffer areas as described in Alternative 3 will more effectively maintain functioning ecosystems for plant communities and any threatened and endangered plant species. Restricting entry is unquestionably the most effective method for minimizing the spread of disease and noxious weeds. Alternative 4 and 5 do not have proven methodology to support utilizing resistant stock to replace Port-Orford-cedar killed by disease and it is unknown if resistant stock would be effective, if used.

  As a result of the improved efficacy at containment, stated increase in conservation of sensitive resources, and relatively modest increase in cost over Alternative 2, we recommend that Alternative 3 should be the preferred alternative

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- Baseline data regarding rare plant species distribution and abundance in the 32 uninfested 6th field watersheds would greatly increase our understanding of how the watersheds will provide for these plant species and what effect the loss of Port-Orford-cedar will have on rare species and ecosystems. The DSEIS contains almost no information on the characteristics of the 32 6th field watersheds and how those watersheds compare to infected watersheds with respect to sensitive resources and Port-Orford-cedar vegetation diversity. It is evident from viewing the maps that the watersheds differ widely in allocated land uses, types of access (road or trail), amount of access (number of entering roads or trails), traffic volume, distance to infected stands, and stakeholder interest. From these general differences, it appears that the 32 watersheds would also vary greatly in their response to protective measures, impacts to riparian ecosystems, direct costs of protection, and indirect costs in the form of foregone harvest and employment. The alternatives and analysis presented in Chapters 2 through 4 do not provide sufficient information or flexibility to allow for site-specific considerations or decisions among the 32 6th field watersheds. The options for decision-makers are artificially constrained by treating the 32 watersheds as a collective entity.

- Monitoring results should be provided and clearly summarized to date in the DSEIS regarding how effective current management practices may be and how to improve their effectiveness for future management of Port-Orford-cedar.

**Specific Comments**

- Page 2-14, the risk key is subjective and open to interpretation. The risk key is difficult to understand and could be re-worded to place emphasis on the stated need of the DSEIS. Appendices 1 and 3 contain Port-Orford-cedar management direction for all administrative units except the Siskiyou National Forest, but it is not apparent from reading that language how any of it can be applied with any consistency in using the risk key. Much of the cost-advantage of Alternative 2 over Alternative 1 is attributable to site-specific decision-making and cost-avoidance resulting from use of the risk key, but there is no discussion how those predictions of field decisions were made.

- There does not appear to be a significant difference regarding the cost-benefit ratio comparing Alternative 2 and 3. Table S-2 shows less acres infested in 100 years in Alternative 3 and only an increased cost of $35,000 with job decreases for both alternatives. The DSEIS provides some discussion of the basis for direct costs, but no assessment as to whether those historical expenditures were considered adequate in limiting the rate of spread of disease, or whether those expenditures simply reflected the amount of funding that was available at the time.

- Impacts to fish species should be included in a biological evaluation as part of the Appendices.

- We anticipate there will be a need to proceed with Section 7 consultation to address potential effects upon listed species. Representatives of the Forest Service, Bureau of Land Management, NOAA Fisheries and the Service met on September 11, 2003 to

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initiate Level 1 Streamlining Consultation Team discussions. This group will identify and prepare the information necessary for the biological assessment and subsequent consultation, if needed.

If you have any questions about this letter, please contact Lynn Gemlo at (541) 957-3473 or me at (541) 957-3470. Thank you.

Sincerely,

/s/ Craig A. Tuss

Craig A. Tuss
Field Supervisor

cc: Michael Long, AFWO, Arcata, CA (e)
Brendan White, OFWO, Portland, OR (e)
Jon Hale, RO, Portland, OR (e)

**BOARD OF COMMISSIONERS**

**DOUG ROBERTSON JOYCE MORGAN DAN VANSLYKE**

1036 S.E. Douglas Ave., Room 217 • Roseburg, Oregon 97470 • (541) 440-4201

DOUGLAS COUNTY

September 9, 20003

Port-Orford-cedar SEIS Team
P.O. Box 2965
Portland, OR 97208

RE: Draft Supplemental Environmental Impact Statement for Management of Port-Orford-cedar in Southwest Oregon 3400FS/5820(BLM)(OR-935)

Dear SEIS Team:

The Board of Commissioners of Douglas County, Oregon appreciates this opportunity to review and comments on the "Draft Supplemental Environmental Impact Statement for Management of Port-Orford-cedar in Southwest Oregon" ("DSEIS"). The DSEIS is a thorough and in depth compilation of the natural history of the Port Orford cedar and its pathogen, *Phytophthora lateralis*.

While it is recognized that *P. lateralis* is a management concern, the Port Orford cedar is not at risk of extirpation. The slow spread of *P. lateralis* is notable and affords the land managers not only an opportunity to manage the disease in a deliberate manner, it also provides an opportunity to develop seedlings with genetic resistance.

Of the five alternatives presented in the DSEIS, the management strategies presented in Alternatives 1 and 2, best serve to balance the degree of risk with the need for maintenance of the Port Orford cedar as an ecologically and economically significant species on Bureau of Land Management and National Forest System lands.

Douglas County does not support Alternative 3, in that it does not meet the purposes set forth for the DSEIS nor the objectives of the Northwest Forest Plan. Alternatives 1 or 2 best meet the balance of the Northwest Forest Plan.

If you have any questions on these comments please don't hesitate to contact this office.

Respectfully submitted,
The Board of Commissioners
Douglas County, Oregon

Joyce Morgan, Chair

Dan Van Slyke, Commissioner

Doug Robertson, Commissioner

# Oregon

Theodore R. Kulongoski, Governor

**Department of Forestry**
State Forester's Office
2600 State Street
Salem, OR 97310
503-945-7200
FAX 503-945-7212
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http://www.odf.state.or.us

"STEWARDSHIP IN FORESTRY"

Ken Denton
Port-Orford-cedar SEIS Team
P.O. Box 2965
Portland, OR 97208

October 26, 2003

Dear Mr. Denton:

Thank you for the opportunity to comment on the draft SEIS for the management of Port-Orford-cedar (POC) in southwest Oregon.

The Oregon Department of Forestry (ODF) has a strong interest in maintaining POC as an ecologically and economically significant species on all ownerships in southwest Oregon. The SEIS provides an excellent synthesis of existing information on the species and the pathogen that threatens it, and reflects years of practical management experience.

We support Alternative 2, which provides for an integrated approach to reducing damage from *Phytophthora lateralis*. Alternative 3 also is attractive because it affords the greatest degree of protection to currently uninfested areas. However, substantial practical difficulties and possible inequities likely would result from adopting all 32 core areas. Within the scope of Alternative 2, it might be possible to identify a subset of core areas listed in Alternative 3 that would receive a very high level of protection. Selection of this subset could be based on criteria such as representation in POC genetic breeding blocks, or abundance of unique plant communities.

In southwest Oregon, little or no POC naturally occurs on State Forest lands. Clearly much POC exists on private forestland in the northern part of the POC range. The SEIS correctly characterizes the situation with regards to checkerboard private and BLM land ownership, shared road access, and lack of regulations specifically addressing Port-Orford-cedar root disease. Alternative 2 does, however, include private lands in the solution through community outreach and by making available disease-resistant seedlings. Private landowners could play a larger role in POC management in this zone if the Federal agencies cooperated with ODF to provide assistance and incentives to private landowners and operators. The appropriate channel for this is through the ODF Private and Community Forests Program. This newly formed program promotes voluntary investments in management of private and community forests through technical and financial assistance, education, and other incentives.

POC root disease is not specifically addressed in the Oregon Forest Practices Act. However, during inspections of Forest Activities, ODF has the opportunity before and during operations to make written recommendations to operators. These recommendations are not requirements, and failure to comply would not be a violation of law, but they are a very effective and specific means of communicating project level management practices.

We do not support alternatives 4 or 5, primarily because they would result in unnecessary loss of resource values, and possibly POC genes, and compromise the overall effort to minimize losses to this exotic pathogen. Although we have become accustomed to *P. lateralis* in southwest Oregon ecosystems and in landscapes throughout the state, it is not "naturalized" and should be treated as an exotic pathogen. It follows that the USFS and BLM should make all reasonable efforts to mitigate losses and especially to reduce spread of the disease.

Sincerely,

Alan Kanaskie

Alan Kanaskie
Forest Pathologist

akanaskie@odf.state.or.us

# Appendix 12: Port-Orford-Cedar Disease-Free Watersheds

**Table A12-1.—*Port-Orford-cedar disease-free 6th field [Alternative 3] watersheds*** [1]

| Watershed number | Watershed name | Core Matrix/ Riparian Reserve/ Adaptive Manage-ment Area acres | Core reserve acres [2, 3] | Port-Orford-cedar buffer acres | Total sub-water-shed acres [4] | % Federal owner-ship |
|---|---|---|---|---|---|---|
| ***Roseburg*** | | | | | | |
| 171003021204 | Shields | 5 | 105 | 6,773 | 25,561 | 27 |
| Total | [1 watershed] | 5 | 105 | 6,773 | 25,561 | 27 |
| ***Medford*** | | | | | | |
| 171003100105 | Rogue River/Lower Hellgate | 0 | 285 | 10,954 | 12,847 | 87 |
| 171003100401 | Rogue River/Whiskey Creek | 0 | 779 | 13,266 | 15,090 | 93 |
| 171003100406 | Rogue River/Missouri Creek | 6 | 2,000 | 11,485 | 14,850 | 91 |
| 171003110501 | Upper Deer Creek | 6 | 1,902 | 9,319 | 14,347 | 88 |
| 171003100101 | Rogue River/Upper Hellgate | 359 | 45 | 17,742 | 32,936 | 55 |
| 171003110405 | Lower West Fork Illinois River | 354 | 137 | 3,285 | 12,161 | 30 |
| 171003110502 | Middle Deer Creek | 0 | 106 | 7,799 | 18,390 | 43 |
| 171003110504 | Lower Deer Creek | 479 | 94 | 10,529 | 23,224 | 48 |
| 171003110601 | Illinois River/Kerby | 429 | 101 | 7,611 | 18,279 | 45 |
| Total | [9 watersheds] | 1,633 | 5,449 | 91,990 | 162,124 | 61 |
| ***Siskiyou*** | | | | | | |
| 171003100103 | Taylor Creek | 106 | 305 | 15,484 | 17,649 | 90 |
| 171003110101 | Upper East Fork Illinois River | 0 | 1,775 | 8,537 | 10,312 | 100 |
| 171003110404 | Rough and Ready Creek | 34 | 2,013 | 21,260 | 23,852 | 98 |
| 171003110602 | Josephine Creek | 236 | 4,627 | 22,867 | 27,773 | 100 |
| 171003110602 | Sixmile Creek | 136 | 577 | 13,326 | 14,319 | 98 |
| 171003110604 | Baker Creek | 0 | 440 | 20,388 | 21,302 | 98 |
| 171003110702 | Lower Briggs Creek | 178 | 1,773 | 15,276 | 19,104 | 90 |
| 171003110801 | Florence Creek | 0 | 144 | 11,739 | 11,883 | 100 |
| 171003110802 | Klondike Creek | 0 | 537 | 9,491 | 10,028 | 100 |
| 171003110804 | Middle Illinois River | 0 | 416 | 21,857 | 22,273 | 100 |
| 171003110901 | Upper Silver Creek | 676 | 395 | 26,294 | 27,484 | 100 |
| 171003111003 | North Fork Indigo Creek | 0 | 361 | 18,905 | 19,287 | 100 |
| 171003120103 | Box Canyon Creek | 0 | 146 | 9,406 | 9,552 | 100 |
| 171003120104 | Tin Cup Creek | 0 | 1,062 | 16,690 | 17,752 | 100 |
| 171003120105 | Chetco River/Sluice Creek | 0 | 488 | 13,991 | 14,479 | 100 |
| 171003120106 | Boulder Creek | 0 | 987 | 12,987 | 13,974 | 100 |
| 171003120108 | South Fork Chetco River | 1 | 147 | 27,743 | 28,811 | 97 |
| 180101010101 | Chrome Creek [Upper North Fork Smith River] | 0 | 2,861 | 21,650 | 24,511 | 100 |
| 180101101102 | Baldface Creek | 0 | 3,355 | 16,441 | 19,796 | 100 |
| 171003090604 | Slate Creek | 917 | 0 | 15,322 | 28,409 | 57 |
| 171003110701 | Upper Briggs Creek | 1,488 | 647 | 22,044 | 24,626 | 98 |
| Total | [21 watersheds] | 3,772 | 23,055 | 361,703 | 407,179 | 95 |
| **Grand total** | **[31 watersheds]** | **5,419** | **28,609** | **460,464** | **594,863** | **83** |

[1] Uninfested 6th field watersheds with at least 100 acres of Federal POC serve as the basis for POC core and buffer areas under Alternative 3. Acres reflect stands assumed lost in Biscuit Fire [see Map 1].
[2] Data is approximate, based on current Agency mapping analyzed with GIS systems. Actual size of core and buffer areas may vary based on actual field conditions.
[3] Reserves include Late-Successional Reserves, Congressional Reserves, and Administratively Withdrawn.
[4] Includes private acres.

**Table A12-2.—*Port-Orford-cedar disease-free 7th field [Alternatives 2 and 6] watersheds*** [1]

| Watershed number | | Core Matrix/ Riparian Reserve/ Adaptive Manage-ment Area acres | Core reserve acres [2, 3] | Port-Orford-cedar buffer acres | Total sub-water-shed acres [4] | % Federal owner-ship |
|---|---|---|---|---|---|---|
| ***Roseburg*** | | 0 | 0 | 0 | 0 | 0 |
| Total | [0 watersheds] | 0 | 0 | 0 | 0 | 0 |
| ***Medford*** | | | | | | |
| 17100310010536 | | 0 | 227 | 951 | 1,178 | 100 |
| 17100310010539 | | 0 | 950 | 504 | 1,454 | 100 |
| 17100310010545 | | 0 | 546 | 836 | 1,382 | 100 |
| 17100309050103 | | 2 | 514 | 621 | 1,251 | 91 |
| 17100309050218 | | 0 | 188 | 3,139 | 5,152 | 65 |
| 17100310010603 | | 0 | 115 | 450 | 781 | 72 |
| 17100310040103 | | 0 | 174 | 2,065 | 2,929 | 76 |
| 17100310040106 | | 0 | 605 | 2,038 | 2,643 | 100 |
| 17100310040212 | | 0 | 239 | 747 | 986 | 100 |
| 17100310040215 | | 0 | 324 | 2,781 | 3,105 | 100 |
| 17100310040612 | | 0 | 113 | 1,201 | 1,314 | 100 |
| 17100310040618 | | 6 | 1,076 | 2,670 | 3,752 | 100 |
| 17100310040630 | | 0 | 797 | 620 | 1,417 | 100 |
| 17100310040727 | | 0 | 109 | 248 | 357 | 100 |
| 17100311050106 | | 0 | 217 | 690 | 941 | 96 |
| 17100311050115 | | 0 | 460 | 847 | 1,615 | 81 |
| 17100311050121 | | 0 | 377 | 1,241 | 1,986 | 81 |
| 17100311050203 | | 0 | 106 | 552 | 1,170 | 56 |
| Total | [18 watersheds] | 8 | 7,137 | 22,201 | 33,414 | 88 |
| ***Siskiyou*** | | | | | | |
| 03B01F | | 0 | 103 | 2,836 | 2,939 | 100 |
| 03B02F | | 0 | 286 | 1,304 | 1,590 | 100 |
| 03B04W | | 0 | 219 | 1,877 | 2,096 | 100 |
| 03B08W | | 0 | 136 | 1,688 | 1,824 | 100 |
| 03L01W | | 0 | 196 | 1,557 | 1,753 | 100 |
| 03L02F | | 0 | 122 | 1,567 | 1,689 | 100 |
| 03M05W | | 0 | 212 | 1,347 | 1,559 | 100 |
| 03T01W | | 0 | 557 | 1,438 | 1,995 | 100 |
| 03T05F | | 0 | 168 | 2,888 | 3,056 | 100 |
| 03T07F | | 0 | 140 | 2,308 | 2,448 | 100 |
| 03U11W | | 0 | 416 | 695 | 1,111 | 100 |
| 03U12W | | 0 | 127 | 1,360 | 1,487 | 100 |
| 03U15W | | 0 | 310 | 1,060 | 1,370 | 100 |
| 04H02F | | 118 | 22 | 2,378 | 2,518 | 100 |
| 04M01F | | 0 | 119 | 1,444 | 1,570 | 99 |
| 04M04W | | 0 | 297 | 1,018 | 1,315 | 100 |
| 04M05W | | 1 | 146 | 1,191 | 1,338 | 100 |
| 05E06W | | 0 | 746 | 1,726 | 2,472 | 100 |
| 07L04W | | 0 | 205 | 207 | 412 | 100 |
| 07L05W | | 0 | 184 | 574 | 758 | 100 |
| 07L08W | | 136 | 89 | 368 | 593 | 100 |

| Watershed number | Core Matrix/ Riparian Reserve/ Adaptive Manage-ment Area acres | Core reserve acres [2, 3] | Port-Orford-cedar buffer acres | Total sub-water-shed acres [4] | % Federal owner-ship |
|---|---|---|---|---|---|
| 07L13W | 0 | 119 | 417 | 536 | 100 |
| 07L14W | 0 | 323 | 1,123 | 1,446 | 100 |
| 07M06F | 0 | 140 | 1,506 | 1,646 | 100 |
| 08N01F | 0 | 160 | 2,520 | 2,680 | 100 |
| 09U14W | 89 | 79 | 958 | 1,126 | 100 |
| 09U16W | 259 | 70 | 1,307 | 1,636 | 100 |
| 10C02F | 0 | 105 | 2,194 | 2,299 | 100 |
| 10C03W | 44 | 362 | 2,170 | 2,576 | 100 |
| 10C07W | 2 | 170 | 879 | 1,051 | 100 |
| 10C09W | 0 | 173 | 1,399 | 1,572 | 100 |
| 10C10W | 40 | 682 | 960 | 1,682 | 100 |
| 10K01W | 0 | 290 | 3,601 | 3,891 | 100 |
| 10K03W | 0 | 168 | 3,022 | 3,190 | 100 |
| 10L01F | 0 | 151 | 2,478 | 2,629 | 100 |
| 11B02W | 7 | 170 | 1,536 | 1,802 | 94 |
| 11B03F | 0 | 273 | 1,889 | 2,162 | 100 |
| 11B05W | 0 | 113 | 889 | 1,002 | 100 |
| 11B06F | 0 | 101 | 1,276 | 1,377 | 100 |
| 11B08W | 25 | 232 | 1,552 | 1,809 | 100 |
| 11O05F | 63 | 240 | 1,936 | 2,241 | 99 |
| 11S01F | 0 | 370 | 1,434 | 1,804 | 100 |
| 11S03W | 0 | 149 | 859 | 1,198 | 84 |
| 11S04W | 43 | 251 | 1,945 | 2,508 | 89 |
| 11U01F | 32 | 180 | 1,492 | 1,704 | 100 |
| 11U02W | 71 | 35 | 474 | 580 | 100 |
| 11U03F | 191 | 7 | 2,067 | 2,265 | 100 |
| 11U07W | 149 | 1 | 1,213 | 1,363 | 100 |
| 11U11F | 191 | 0 | 786 | 980 | 99 |
| 11U12W | 112 | 36 | 804 | 952 | 100 |
| 11U13W | 155 | 1 | 854 | 1,010 | 100 |
| 12J02W | 0 | 154 | 2,295 | 2,450 | 99 |
| 12J03F | 29 | 127 | 1,530 | 1,686 | 100 |
| 12J05W | 0 | 218 | 1,668 | 1,886 | 100 |
| 12J07F | 0 | 202 | 1,147 | 1,349 | 100 |
| 12J09W | 0 | 645 | 2,013 | 2,658 | 100 |
| 12J10W | 4 | 149 | 1,355 | 1,508 | 100 |
| 12J12W | 0 | 128 | 635 | 763 | 100 |
| 12J13W | 19 | 204 | 1,169 | 1,392 | 100 |
| 12J14F | 83 | 58 | 2,074 | 2,235 | 99 |
| 12J15F | 76 | 817 | 1,578 | 2,488 | 99 |
| 12J16W | 0 | 769 | 1,323 | 2,092 | 100 |
| 12J17W | 0 | 1,051 | 1,103 | 2,155 | 99 |
| 12L11W | 0 | 171 | 1,073 | 1,244 | 100 |
| 12U09F | 0 | 163 | 2,329 | 2,650 | 94 |
| 13D06W | 227 | 8 | 724 | 1,021 | 94 |
| 13D10W | 6 | 719 | 959 | 2,212 | 76 |
| 14E08W | 37 | 132 | 1,484 | 2,272 | 73 |
| 14E10W | 0 | 216 | 612 | 1,578 | 52 |
| 14M04W | 165 | 0 | 1,102 | 1,296 | 98 |

| Watershed number | Core Matrix/ Riparian Reserve/ Adaptive Manage-ment Area acres | Core reserve acres [2, 3] | Port-Orford-cedar buffer acres | Total sub-water-shed acres [4] | % Federal owner-ship |
|---|---|---|---|---|---|
| 14M06W | 0 | 250 | 293 | 565 | 96 |
| 14M07W | 8 | 1,056 | 548 | 1,612 | 100 |
| 14R01F | 18 | 154 | 2,111 | 2,561 | 89 |
| 14R04F | 0 | 256 | 1,200 | 1,457 | 99 |
| 14R06F | 0 | 165 | 1,995 | 2,160 | 100 |
| 14R08W | 0 | 397 | 1,544 | 1,941 | 100 |
| 14R09F | 0 | 104 | 1,388 | 1,492 | 100 |
| 14R13W | 0 | 351 | 1,965 | 2,316 | 100 |
| 14R14F | 0 | 289 | 2,071 | 2,360 | 100 |
| 14W02W | 43 | 358 | 1,394 | 2,453 | 73 |
| 14W03W | 0 | 750 | 413 | 1,163 | 100 |
| 14W05W | 0 | 674 | 469 | 1,616 | 71 |
| 15D01F | 36 | 139 | 1,818 | 2,134 | 93 |
| 15D04W | 1 | 447 | 626 | 1,074 | 100 |
| 15D05W | 80 | 55 | 846 | 981 | 100 |
| 15D09W | 70 | 77 | 1,315 | 1,462 | 100 |
| 15U01W | 0 | 143 | 269 | 412 | 100 |
| 15U02F | 0 | 187 | 2,242 | 2,429 | 100 |
| 15U03W | 0 | 525 | 844 | 1,369 | 100 |
| 15U04F | 0 | 165 | 1,975 | 2,140 | 100 |
| 15U05W | 0 | 438 | 705 | 1,143 | 100 |
| 15U06W | 0 | 313 | 2,314 | 2,627 | 100 |
| 16A08W | 273 | 7 | 419 | 699 | 100 |
| 16A09F | 658 | 318 | 1,061 | 2,037 | 100 |
| 16A10W | 146 | 312 | 1,770 | 2,228 | 100 |
| 16A11F | 664 | 50 | 822 | 1,536 | 100 |
| 17C03F | 0 | 200 | 1,719 | 1,919 | 100 |
| 17G04W | 0 | 142 | 1,187 | 2,028 | 66 |
| 17G07W | 164 | 10 | 544 | 718 | 100 |
| 17G13W | 12 | 335 | 621 | 968 | 100 |
| 17L03W | 9 | 98 | 1,850 | 1,986 | 98 |
| 17S16F | 0 | 110 | 1,460 | 1,570 | 100 |
| 18S02W | 109 | 0 | 1,240 | 1,520 | 89 |
| 18S04W | 179 | 0 | 993 | 1,172 | 100 |
| 18S06F | 180 | 0 | 1,976 | 3,207 | 67 |
| 18S07W | 113 | 0 | 876 | 989 | 100 |
| 18S09W | 157 | 0 | 1,412 | 1,636 | 96 |
| 20N02W | 217 | 120 | 1,169 | 1,506 | 100 |
| 20N07F | 7 | 421 | 649 | 1,077 | 100 |
| 20S08W | 0 | 226 | 1,822 | 2,702 | 76 |
| 22M01F | 0 | 108 | 2,647 | 3,040 | 91 |
| 22M09W | 0 | 1,212 | 951 | 2,235 | 97 |
| 23L03W | 38 | 123 | 876 | 1,099 | 94 |
| 23L06W | 1 | 347 | 1,017 | 1,377 | 99 |
| 26F08W | 84 | 45 | 1,215 | 1,344 | 100 |
| 26F11W | 136 | 0 | 1,457 | 1,674 | 95 |
| 26G06W | 160 | 10 | 796 | 966 | 100 |
| 26G10W | 0 | 230 | 617 | 847 | 100 |
| 26T10W | 28 | 115 | 1,289 | 1,432 | 100 |

| Watershed number | | Core Matrix/ Riparian Reserve/ Adaptive Manage-ment Area acres | Core reserve acres [2, 3] | Port-Orford-cedar buffer acres | Total sub-water-shed acres [4] | % Federal owner-ship |
|---|---|---|---|---|---|---|
| 30M05W | | 0 | 215 | 439 | 852 | 77 |
| 30S07W | | 0 | 103 | 612 | 715 | 100 |
| 31A04W | | 0 | 193 | 448 | 807 | 79 |
| 31B01W | | 4 | 235 | 1,440 | 1,699 | 99 |
| 31C01W | | 0 | 106 | 1,726 | 1,832 | 100 |
| 31C04W | | 0 | 243 | 71 | 314 | 100 |
| 31C08W | | 0 | 108 | 1,013 | 1,121 | 100 |
| 83E07W | | 314 | 0 | 1,292 | 2,091 | 77 |
| 90B01F | | 0 | 269 | 2,603 | 2,872 | 100 |
| 90B02W | | 0 | 263 | 1,569 | 1,832 | 100 |
| 90B03F | | 0 | 447 | 2,893 | 3,340 | 100 |
| 90B04W | | 0 | 130 | 2,491 | 2,621 | 100 |
| 90B05W | | 0 | 321 | 1,165 | 1,486 | 100 |
| 90B06W | | 0 | 231 | 538 | 769 | 100 |
| 90B08W | | 0 | 894 | 572 | 1,466 | 100 |
| 90B09W | | 0 | 423 | 1,973 | 2,396 | 100 |
| 90B10W | | 0 | 297 | 1,805 | 2,102 | 100 |
| 90C01F | | 0 | 208 | 2,027 | 2,235 | 100 |
| 90C03W | | 0 | 338 | 952 | 1,290 | 100 |
| 90C06W | | 0 | 282 | 1,285 | 1,567 | 100 |
| 90L02F | | 60 | 1,228 | 468 | 2,231 | 79 |
| 90L05W | | 0 | 748 | 105 | 853 | 100 |
| 90L06F | | 0 | 105 | 939 | 1,044 | 100 |
| 90L07F | | 0 | 617 | 165 | 782 | 100 |
| 90N09W | | 0 | 163 | 1,864 | 2,027 | 100 |
| Total | [144 watersheds] | 6,343 | 35,881 | 193,799 | 244,867 | 96 |
| **Grand total** | **[162 watersheds]** | **6,351** | **43,018** | **216,000** | **278,281** | **95** |

[1] 7th field watersheds with at least 50 percent Federal ownership, at least 100 acres of POC, and either uninfested or infestation limited to the lowermost 2 acres of the watershed, serve as the basis for POC core and buffer areas under Alternative 6 and are linked to the risk key in Alternative 2. Acres reflect stands assumed lost in Biscuit Fire [see Map 3].
[2] Data is approximate, based on current Agency mapping analyzed with GIS systems. Actual size of core and buffer areas may vary based on actual field conditions.
[3] Reserves include Late-Successional Reserves, Congressional Reserves, and Administratively Withdrawn.
[4] Includes private acres.

# Appendix 13: Equipment Cleaning Checklist

*This checklist (for optional use) is referenced in the Washing Project Equipment management practice described in Chapter 2, Alternative 2.*

The purpose of this checklist is to provide guidance in the cleaning of equipment, as stipulated in contracts, to control or prevent the spread of noxious weeds and PL. The checklist directs attention to specific areas on equipment that are likely to accumulate soil and organic material. Questions to ask about overall equipment cleanliness are:

1) Does the equipment appear to have been cleaned?
2) Is the equipment clean of clumps of soil and organic matter?

**Rubber-Tired Vehicles**

- ☐ Tires
- ☐ Wheel rims (underside and outside)
- ☐ Axles
- ☐ Fenders/wheel wells/trim
- ☐ Bumpers

**Track-Laying Vehicles**

- ☐ Tracks
- ☐ Road wheels
- ☐ Drive gears
- ☐ Sprockets
- ☐ Roller frame
- ☐ Track rollers/idlers

**All Vehicles**

- ☐ Frame
- ☐ Belly pan (inside)
- ☐ Stabilizers (jack pads)
- ☐ Grapple and arms
- ☐ Dozer blade or bucket and arms
- ☐ Ripper
- ☐ Brush rake
- ☐ Winch
- ☐ Shear head
- ☐ Log loader
- ☐ Water tenders (empty or with treated water)
- ☐ Trailers (low-boys)
- ☐ Radiator/grill
- ☐ Air filter/pre-cleaner
- ☐ Struts/springs/shocks
- ☐ Body seams